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WITH SUPPLEMENT

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BRITISH MEDICAL JOURNAL

LONDON SATURDAY JANUARY 18 1941

TRENDS IN NUTRITION*

BY

SIR JOHN BOYD ORR, M.D., F.R.S.

The treatment of disease falls entirely within the sphere of the medical profession. There has consequently been little delay in applying the advances in our knowledge of nutrition to the treatment of deficiency diseases. But for the prevention of deficiency diseases we need a supply of protective foods sufficient for the needs of the whole population and at a price within the purchasing power of everybody. This involves economic and political problems which are regarded as being outside the sphere of medicine. There has for this reason been a greater delay in the prevention of deficiency diseases and the promotion of the higher standard of national health and physical fitness, which we now know can be attained by proper feeding, than in the advance of therapeutic dietetics.

Though progress has been slower in applying our new knowledge in preventive medicine a great deal has been attained in recent years by public health measures supplying milk, cod-liver oil, and other protective foods, free or at a cheap price, at child welfare centres, ante-natal clinics, and schools. These measures have helped to prevent the grosser forms of deficiency diseases among mothers and children of the poorer classes. One of the best features of this public health work is the closer supervision of health, with the earlier detection and treatment of diseases due to faulty diet.

In the present circumstances, when the whole nation is putting forth its maximum effort for victory, it is of the utmost importance that the entire population should receive a diet which will maintain the highest degree of health and fitness that can be attained by proper feeding. It is difficult to do this under war conditions. The valuable public health work which was rapidly eliminating the worst forms of deficiency diseases among the poor is liable to be to some extent dislocated, and the supply of certain of the more important protective foods, such as eggs and imported fruits, is decreasing. The newer knowledge of nutrition which is of practical value must be brought to bear upon the problem to enable us to get through the difficult war and post-war period not only without a worsening of the national diet but, if possible, with an acceleration of the rate of improvement in recent years.

This raises the question of what knowledge is of practical value. The science of nutrition has been advancing so rapidly that there is difficulty in judging what has been definitely established. There is much room for differences of opinion. In the leisurely times of peace, discussion and dispute, followed by further investigations to clear up the points in dispute, form a normal and natural aspect of research effort. Under the present hectic conditions there is no time for discussion on minor points. We must take the information that is regarded by the majority of the profession as established and concentrate our efforts on getting it applied. It is of interest, therefore, to consider what knowledge can be regarded as of immediate practical value. The main questions are: To what extent does malnutrition exist or, in other words, to what extent could national health be improved by better feeding? What are the effects of malnutrition on national health and physique? In what respects are diets deficient and how can the deficiencies be made good from the food resources available? And, lastly: What bearing has the new knowledge of nutrition upon the national effort for victory and upon schemes for post-war reconstruction?

The Extent of Malnutrition

It is generally agreed that "deficiency diseases" are due to faulty diet. But there must obviously be many gradations of ill-health, from the highest state of health, which can be attained by perfect feeding, to conditions so gross that they are referred to as diseases. There is not complete agreement on the extent to which intermediate stages of deficiency diseases account for the rather vague and indefinite ill-health which is so prevalent. Attempts have been made to estimate this by various means, but we are not unanimous as to the validity of the methods of assessment of the state of nutrition used nor of the findings obtained by these methods. It will be of interest to consider these and see what can be regarded as being generally accepted.

Methods of assessing the State of Nutrition

Physiological and Chemical Tests.—Tests such as the hemeralopia test for deficiency of vitamin A, and chemical examination of body fluids to determine the phosphatase level or the degree of saturation with various vitamins and minerals, are giving interesting results. But the significance of certain of these tests is still in dispute. For example, some workers cannot find a close correlation between the results of hemeralopia tests and the intake of vitamin A or between the results of these tests and clinical signs of deficiency of this vitamin, and not all workers are agreed that saturation with ascorbic acid is necessary for perfect health. The increase of knowledge may bring about modifications in these tests and in the standards by which the results are judged. The principles on which such tests are based and sound and in the near future

* Summary of a British Medical Association Lecture delivered to the Leeds Division on November 12, 1940.

they will be generally accepted as valid. Those who have been carrying out research in this field, such as Harris and his co-workers at Cambridge, have done invaluable work. At the present stage, however, all that can be said with certainty about the results is that they indicate that the diet of a large proportion of the people in this country is not up to the optimum, and that in some cases it is so deficient that clinical signs of deficiency might be expected.

Clinical Assessment.—Clinical assessment presents difficulties because in minor degrees of deficiency there are few clear-cut clinical signs or symptoms which arise from specific deficiencies and from no other cause. Thus, for example, in minor degrees of deficiency of vitamin B_1 there is loss of appetite and there may be vague aches and pains of a rheumatic character, cardiac and intestinal derangements, and mental symptoms. All these, however, may arise from psychological or material causes other than deficiency of B_1. The same applies to a large extent to signs of deficiency of other vitamins or minerals. Clinical signs which are easily distinguished and characteristic of specific deficiencies occur only in the later stages of deficiency diseases and therefore are of limited value in estimating the extent to which minor degrees of malnutrition occur. When, however, a more detailed examination is made—as, for example, by *x* rays for rickets and estimation of haemoglobin for anaemia—many cases of subacute malnutrition are seen to exist in children who show no gross signs of ill-health.

In the past the clinical training of the medical student has not made him well fitted to recognize minor degrees of malnutrition. The clinical material for his training consisted of hospital patients who were nearly all in a rather advanced state of ill-health, and the student was too apt to classify the population into two categories—those so ill that they required medical treatment, and the rest of the population not seeking medical treatment, the average health of which was regarded as the normal. This standard of health is far below what we now regard as attainable. In some schools physiological and clinical teaching has begun with subjects of perfect health and physique with the idea of imparting a proper standard of health.

Dietary Surveys.—An estimate of the extent of malnutrition can be got by comparing the kind of diet in common use in different classes with the modern standard of requirements. If these standards be correct, then it may be assumed that the people on diets markedly below these standards are likely to suffer from malnutrition. There are three well-known standards—the British Medical Association diet at minimum cost; the "Stiebeling" diet at moderate cost, published by the U.S.A. Government Department of Home Economics; and the League of Nations diet, which is an optimum one irrespective of cost. Crawford has converted the B.M.A. diets into their nutrient constituents, allowance being made in accordance with the B.M.A. recommendation for one pint of milk daily for children from birth to 5 years, half a pint from 5 to 10, and a quarter of a pint for other persons. When the three diets are reduced to their nutrient constituents it is found that there is close agreement between them, the Stiebeling diet at moderate cost being a little more generous than the B.M.A. diet at minimum cost, and the League of Nations optimum diet a little better than the Stiebeling one. These standards were drawn up independently by different groups of experts, and can be accepted as fairly reliable indications of requirements. When diets in common use are compared with these standards it is found that the average intake of some minerals and most of the vitamins among poor families with children is low.

Feeding Tests.—If we accept as our definition of malnutrition a condition which can be improved by improving the diet, then the surest method of estimating malnutrition is to do feeding tests. The results of tests such as those in which additional milk was given to school children, and the experiment with the modified Oslo breakfast done by Borland in 1938, show that the average degree of health, which is often taken as the normal, can definitely be improved in a large proportion of these children. The marked improvement in health and physique of young recruits on joining the Army is undoubtedly largely due to better feeding.

In the last twenty-five years the average consumption of protective foods in this country has increased by roughly about 50%, and there has been a corresponding remarkable improvement in national health, shown by the great reduction in deficiency diseases due entirely to better feeding, by the reduction in infant mortality rates and tuberculosis death rates, and by the improvement in health and rate of growth of children, which can be attributed largely to the same cause. Although there has been such an improvement the results of recent tests indicate that we have not yet reached the limits, or, in other words, there is still ill-health and poor physique which could be eliminated by dietary measures.

All these different methods of assessing the state of nutrition show the same general results. Physiological and biochemical tests indicate that the diet of a large proportion of our children is not up to the optimum. Clinical examinations, such as that made by the Board of Education on rickets in London and Dr. Spence's examination of Newcastle pre-school children, disclose a considerable amount of malnutrition. A comparison of the diets in use with recognized standards shows that large numbers of the population do not receive a diet up to the standards which we now regard as being necessary for health; and, finally, feeding tests with children reveal that improvement of the diet is followed by a corresponding improvement in health. Even allowing for the fact that none of these methods of assessment is absolutely reliable, there can be little doubt about the conclusion, since the same general result is obtained independently by each method. The time is not opportune for discussing what proportion of the population is below the standard of health which we now know can be attained by proper feeding. It is sufficient for our purpose if there is general agreement that there are substantial numbers whose health and physique can be improved.

Effects of Malnutrition: Primary

The primary effects of malnutrition as seen in the deficiency diseases are well known. Only one—the effect on working efficiency, which is of special importance at the present time—need be referred to here. The improvement of the diet of workmen whose diet was not previously up to the standard for health is followed by increased output without any conscious increased effort and also by a reduction in the number of accidents. Many factories are now providing a meal for employees. It is likely that, as part of the national effort for increased output of war material, the provision of a meal will be made compulsory in all factories and measures be taken to ensure that the meal is on the lines of the Oslo breakfast, which will make good the deficiencies of the portion of the diet eaten at home.

Secondary

(*a*) *Infection.*—It is only in recent years that systematic research has been done on the influence of nutrition on susceptibility to infectious disease. About fifteen years ago the subject was investigated by a group of workers

associated with the Rowett Institute, including Prof. Mackie of Edinburgh and the late Prof. J. J. R. McLeod. In experiments with farm animals it was found that certain immunological reactions were considerably affected by the nature of the ration. In direct feeding experiments with rats, in which an infection was introduced into groups of the animals fed differently, it was found that with some infections, though not all, the mortality rate among those on a deficient diet was markedly higher than among those on an adequate diet. The results of these tests are complicated by acquired immunity. It is exceedingly difficult to get large groups of animals completely free from any previous infection which may complicate the results. That condition, however, has been obtained in Professor Topley's department at the London School of Hygiene and Tropical Medicine. His workers found that susceptibility to some infections is affected by diet. Thus, for example, well-fed mice are less susceptible to enteric than comparable animals on a poor diet.

These researches confirm clinical findings such as the increased susceptibility to infections of the cornea in deficiency of vitamin A, the frequent occurrence of bronchopneumonia in children suffering from rickets, and the effect of feeding on tuberculosis. While our knowledge of the effect of diet on immunity to infection is still very limited there can be little doubt that well-fed people are less susceptible to some infections, at least, than ill-fed people, and that the sequelae to many infections such as measles are likely to be more severe in children on a deficient diet.

This is a subject of considerable importance at the present time, when there is a displacement of the population. Endemic diseases in communities which have acquired immunity are apt to be spread to other sections of the population with little or no immunity. In addition to sanitary methods, and widespread immunization in the case of diseases where this method can be effectively employed, there is urgent need to increase the resistance of the people by improving their state of nutrition.

(*b*) *Psychological.*—An aspect of this subject which has so far received little attention is the psychological effect of malnutrition. This is especially marked in those suffering from pellagra, a proportion of whom end up in asylums. Vitamin B_1 deficiency in adults is accompanied by apathy and despondency, and in infants a typical symptom is the whining, whimpering, pathetic cry. A low blood calcium is accompanied by hyperexcitability. Women suffering from nutrition anaemia are usually apathetic, peevish, and easily discouraged. It is doubtful whether there is any physical symptom of malnutrition which is not accompanied by a psychological symptom.

This aspect of malnutrition is now receiving a good deal of attention by educationists. The number of dull or backward children, according to Segar, varies from about 1% among well-to-do families to 20% amongst the poorest families. Many intelligence tests have been used in an attempt to ascertain whether there is a correlation between nutrition and intelligence. As mental ability is an inherited characteristic it is doubtful whether the results of such tests, from one point of view, are of much value. The power to use intelligence, however, depends upon the state of health. A badly fed child suffers from early onset of fatigue and lack of power of concentration, and consequently is slower to learn. In some tests it has been found that supplementary feeding of milk and other protective foods has been followed by a definite improvement in the ability of the child to learn lessons. In a test which covered a period of five months the educational advance in that period was equivalent to the advance normally made by these children in two years. It is estimated that out of between five and six million school children five hundred thousand are dull or backward. While it may be going too far to label these children not mentally deficient but nutritionally deficient, as has been done by one American investigator, there seems little doubt that the number would be drastically reduced if their diets were made adequate. There is some apprehension at the wartime interference with the education of our children. If means were taken to ensure that every child was properly fed it is probable that the interference with the normal educational machine would be compensated for by the greater physical and mental vigour of the children.

In the present circumstances, when all sections of the community are being subjected to the emotional strains of war conditions, this aspect of nutrition assumes great national importance, both for adults, whose working efficiency and morale must be maintained at the highest possible level, and for the children, who when they grow up will need all their physical and mental powers to clear away the wreckage of the present war and build the new and better post-war world for which we are all hoping.

Characteristics of Deficient Diets

So much work has been done and so much written about the effects of deficiencies of the different vitamins or minerals that we are apt to think that improvement of the diet consists in making good these individual deficiencies. In the treatment of gross deficiency diseases vitamin concentrates are useful. They are of less value, however, in dealing with minor degrees of malnutrition, because poor diets are deficient not in one but in many constituents, and if the intake of one be increased the intake of some other immediately becomes the limiting factor for health. What we are dealing with is not diets deficient in one or two constituents but diets deficient in many. In tests the improvement got by giving one nutrient, such as vitamin A, is negligible compared with the improvement obtained by giving milk, which is rich in most of the elements deficient in a poor diet. This is well exemplified in the case of teeth. Deficiencies of vitamins D, A, and C, of calcium, and of magnesium; the effect of carbohydrates in promoting the growth of *B. acidophilus odontolyticus*, which attacks the enamel; mechanical chewing, which affects the growth of the jaws and the tooth-spacing, all help to determine the condition of the teeth. But the correction of any one of these factors will not ensure healthy teeth. Schiötz found in his extensive investigations that of children who had perfect teeth some had had cod-liver oil, some had not; some had been given sweets, some had been kept off sweets; some had brushed their teeth and some had not. But every child who had perfect teeth had had an abundance of milk and green vegetables regularly, without a break. These together supply all the known factors needed for healthy teeth, and possibly also as yet unknown factors. It has been decided to put vitamin B_1 and calcium into white bread. This will certainly to some extent improve diets deficient in these substances, but Harriette Chick's experiments have shown that white bread plus B_1 and calcium is by no means equivalent to wholemeal bread, which contains, in addition to these factors, several others which are equally important.

In planning for a perfect diet we should depend not so much on attempts to provide a sufficient amount of any specific nutrient as on ensuring that the intake of the protective foods is ample. We do not yet know all the dietary constituents which are essential for health, but we do know that a sufficiency of the protective foods will supply everything which the body needs. Fortunately,

everything can be supplied by a few foods—e.g., milk, green vegetables, wholemeal bread, and potatoes. These, taken together in sufficient quantity, would meet all bodily needs for specific constituents.

This is of importance at the present time, when the supply of some of our foods, such as eggs and imported fruit, will be reduced. This country can produce enough milk, vegetables, and potatoes to meet the needs of the whole population, and there is no insurmountable difficulty in making wholemeal bread available. The change over to increased consumption of these protective foods will involve an alteration in dietary habits. The chief change needed for health is to bring the consumption of milk and vegetables among the poor up to what it is among the well-to-do. At a time when all classes are prepared to make sacrifices there should be no difficulty in getting people so to adjust their diets as to increase the consumption of those foodstuffs which can be made available in sufficient amounts, especially as the main feature of the adjustment would be a levelling up of the diet of the poor by increased consumption of protective foods which we can produce at home, and the limitation, without necessary deterioration, of the diet of the well-to-do by reduced consumption of less essential foods.

Even though our agricultural policy were adjusted to provide milk, vegetables, and potatoes in amounts sufficient for the whole population there remains the problem of making them available at a price within the purchasing power of everybody. The Ministry of Food is engaged on a great educational campaign on the nature of body-building foods, protective foods, and energy-yielding foods. The value of this campaign would be greatly increased if specimen diets were given for families with three, four, or five children, and the price of the food stated, showing that families of low-wage earners, unemployed, and men in the Fighting Services could purchase these diets with the income available for food. The Canadian Medical Association has published an excellent booklet showing the kind of diet needed for different families and the cost, and has thereby adjusted propaganda to economic realities.

Nutrition only One Factor needed for Health

Such spectacular results have been obtained in the treatment and prevention of disease by dietary measures that there may be a danger, especially on the part of those working on the subject, of forgetting the importance of other factors. Bad housing and overcrowding, which facilitate the spread of infectious disease; the psychological effects of overcrowding; and the feeling of frustration, worry, and anxiety, and of impotence in the face of environmental difficulties common among the poor, are probably as potent causes of ill-health as faulty diet. These factors will react on one another and reinforce each other. Until they have been eliminated we will not be able to attain the high standard of national health and physical fitness which we know can be attained. They all tend to be associated with poverty.

In the last hundred years the medical profession has developed great resources for the treatment of diseases arising under these conditions. It is now recognized that the duties and responsibilities of the profession must be extended to include the prevention of disease and, further, the promotion of health. When we enter this sphere we are faced with the environmental conditions which affect health and with the associated social, economic, and political factors. The Report of the British Medical Association Committee on Nutrition, and the "Aylesbury Broadside," published by the *Lancet*, show that the profession has the vision and the courage to take cognizance of these factors. The profession must extend its work in this new sphere if it is to play a part commensurate with its great influence and prestige in building up the new and better world for which all men are hoping.

Medicine and the New World Order

The different ideologies which are in conflict promise a new world order. In our own country Mr. Bevin has said that after the war the miseries of poverty will be relegated to the limbo of the past, and Mr. Churchill has declared that we shall go forward in "the march of the common people towards their just and true inheritance and towards the broader and fuller life." Groups of economists and others are already planning, and indeed the Government has recently set up a special department to work out schemes for post-war development.

But we cannot with safety leave the planning of the future to political parties. As the *Times* in a leading article on a speech of President Roosevelt's says, "The gravest danger to democracy lay in the growth in some quarters of a cynical belief that the attitude to the all-important party machines was determined less by the voters than by the economic interests of those who provided the party funds." Nor can we leave it to the economist, who is too apt to think that prosperity consists of a trade boom. The miseries of the slums and the poverty created during the tremendous industrial and trade prosperity of the nineteenth century have convinced all thinking people that trade prosperity and the welfare of the working classes are not necessarily correlated. We must plan for the satisfaction of human needs as well as for trade prosperity.

The medical profession contains within it experts on every subject that affects human welfare. It is the only organized group of men competent to make a statement on human needs. The first essential need for a fuller life for the common people is the provision of environmental conditions which will enable them to attain their fullest inherited capacity for physiological and mental well-being. The British Medical Association might well set up a committee to report on the minimum material and psychological needs for full physiological and mental well-being. It could then, with the authority of the whole profession, recommend that in post-war planning effort should be directed first and foremost to the satisfaction of those needs for the whole population.

Some needs, such as better housing, cannot be dealt with during the war, but others, such as the provision of an adequate diet for everybody, could be met even during the war if we had an agricultural and food policy based solely on the nutritional requirements of the people. If this, the most fundamental need, were met, at the end of the war, even though we were poorer in other respects, we would have taken the first and most important step in the march of the common people to the fuller life, and the provision of plans for meeting other needs would give enthusiasm to continue the march and also confidence that we were travelling in the right direction.

Unfortunately, in the past, as Dr. R. W. L. Ward has pointed out in a recent letter to the *Journal*, the profession has been too much occupied with its own remuneration and failed to recognize its responsibilities towards the bigger issues of national life. At the present time, when the artisan trade unions are surrendering rights and privileges which have been won after such arduous struggles and are throwing the whole weight of their influence into the prosecution of the war in the hope of obtaining a new and better order, the medical profession must do its utmost to ensure that the better order which will compensate for all the sacrifices of the war will in fact materialize. It should assume that it is the custodian of

the health of the people and that it is its duty to define the environmental conditions necessary for the higher state of health which medical science considers can be attained. There is not the slightest doubt that the brave words of Churchill and Bevin are spoken in earnest and that they and other national leaders who are anxious to reorganize our social and economic system for the benefit of the common people would welcome an authoritative statement from the medical profession on the kind of conditions we should plan for. If the profession is willing to make its full contribution to the national effort for victory and for the equally important post-war reconstruction it should begin to do so now.

A CASE OF PULMONARY CONCUSSION ("BLAST") DUE TO HIGH EXPLOSIVE

BY

GEOFFREY HADFIELD, M.D., F.R.C.P.

Professor of Pathology, St. Bartholomew's Hospital

AND

RONALD V. CHRISTIE, M.Sc., M.D., M.R.C.P.

Professor of Medicine, St. Bartholomew's Hospital

It is now well recognized that a proportion of individuals who are exposed to the detonation of high explosive develop pulmonary haemorrhages without any significant injury to the thoracic wall. The number of recorded cases in which such patients have been closely observed and have subsequently died is still quite small. Such a case is recorded below.

Case Report

In November, 1940, a bomb fell on a wooden hut in which the patient, a soldier aged 23, was asleep. No details are available of the immediate effects of the explosion or of the condition of the patient at this time except that he was given morphine 1/4 grain at 4.40 and 1/3 grain at 5.20 and 3,000 units of anti-tetanus serum at 5.30, when he was transferred to hospital.

On admission he was "shocked," dyspnoeic, and cyanosed, and rales could be heard scattered throughout the chest. He had pain in the chest and abdomen and vomited some blood-stained fluid. The abdomen was tender and rigid. The temperature was 100°, and the pulse rate 130 and the respiratory rate 30 per minute. He was given heroin grain 1/12 and atropine grain 1/100, and oxygen was administered. His condition gradually improved. On the morning after admission tubular breathing with an impaired percussion note was found at the left base, but the scattered rales were less conspicuous. A radiograph of the chest showed a diffuse, mottled, woolly shadow throughout the left lung. On the right side there was a similar shadow in the mid-zone and extending out to the periphery from the hilus. The abdomen was still tender and vomiting continued. The temperature was 98.6°, and the pulse rate 120 and the respiratory rate 24 per minute.

It was decided in consultation that the patient should be sent to another hospital, and he was first seen by us thirty-nine hours after the explosion. He was restless and looked ill with high colour and slight cyanosis. There was considerable dyspnoea, with dilatation of the alae nasi on inspiration, but no orthopnoea. He was extremely irritable and resentful of interference, drinking greedily but vomiting large amounts of thin brownish watery fluid which gave a faintly positive guaiacum reaction. His temperature was 99.6°; the pulse rate was 120 and respirations 36 per minute. The tongue was dry and furred. Blood pressure was 126/76. There was generalized tenderness, which made accurate percussion and examination of the back of the chest inadvisable. Movement was diminished on the left side and the breath sounds were obscured by loud rhonchi and scattered coarse rales. The abdomen was distended with flatus and the abdominal wall was rigid and tender. An acute intra-abdominal lesion was suspected, although there was no dullness in the flanks, the liver dullness was not impaired, and bowel sounds were audible. Attempts were made to administer oxygen by means of a B.L.B. mask and spectacle frame, but the patient resisted and would tolerate neither. At 8.30 p.m. his general condition appeared unchanged, although the pulse rate had risen to 140 per minute and there was some congestion of the veins in the neck. His blood pressure was 136/84 and the haemoglobin 125% (Hellige colorimeter).

At this time the indications for treatment seemed somewhat confusing. The furred and dry tongue, the haemoglobin percentage of 125, and the rapid rate of the pulse suggested that plasma should be given. On the other hand, the height of the blood pressure, the distended veins in the neck, the bubbling rales in the chest, and the general appearance of the patient strongly suggested that a venesection should be performed. We decided to do neither, hoping this was a transient crisis precipitated by the journey from the first hospital. As the patient was quiet if left undisturbed, morphine was withheld and he was closely watched. At 11 p.m. it was obvious that his condition was deteriorating. He developed a distressing hiccup, the bubbling rales in his chest could be heard at the end of the bed, his cyanosis was increasing, and the veins in his neck were distended up to the angle of the jaw. The temperature was 102.2°, the pulse rate 144, and the respiration 48. Morphine grain 1/6 was given, but the condition of the patient began to deteriorate even more rapidly. 600 c.cm. of blood was then withdrawn, and this was followed by spectacular improvement. The bubbling rales in the chest rapidly diminished; the patient was quieter, was less restless, and was breathing more easily, and he fell into a light sleep. His blood pressure was not measured lest it disturb him, but the quality of his pulse suggested that it was being maintained at its previous level.

At 5.30 a.m. the patient became much worse and was restless and delirious. The rate of the pulse was 140 per minute, and its volume was poor; there was a systolic blood pressure of 44 mm. Hg, but no congestion of the veins in the neck. The respiratory rate again increased to 40 per minute, but no rales could be heard in the chest anteriorly except in the left axilla. The haemoglobin was 100%. Oxygen was administered with a B.L.B. mask and, as no plasma was immediately available, a transfusion of blood was begun. After the patient had received one-third of a pint clotting occurred. He was then moribund, and died at 7 a.m.

In a sample of blood taken at 11 p.m. the blood urea was 86 mg. per 100 c.cm. and the alkali reserve 60.5 c.cm. per 100 c.cm. plasma.

Post-mortem Examination

The body showed no external signs of injury except a small superficial abrasion on the bridge of the nose. The upper air passages were normal except that they contained a moderate amount of lightly blood-stained thin and frothy mucous fluid. The pericardial fluid was lightly blood-tinged. There were some petechial haemorrhages between the parietal pleura and the thoracic wall and a few larger haemorrhagic areas up to the diameter of a five-shilling piece in size. These were composed of thin laminae of dark blood and were not associated with any recognizable fracture of the ribs or trauma of the thoracic parietes. There was no excess of fluid in the pleural sacs.

Both lungs were large. At least two-thirds of the bulk of the left and about half the bulk of the right lung were consolidated. The visceral pleura showed no laceration, but there were several extensive dark irregular haemorrhagic areas beneath the pleura of both lungs, chiefly disposed about the posterior and basal regions; the largest was roughly rectangular, and measured about 6 by 5 cm. All these lesions were subsequently shown to be continuous, with large foci of deeply seated resolving haemorrhage.

Most of the consolidation in the left lung was basal, posterior, and deeply placed, but there were solid areas deep in

the substance of the upper lobe. The colour of the consolidated parts was that of dark venous blood clot, but their ill-defined edges were bright red, fading off gradually into normally coloured lung. Throughout this dark-coloured consolidated lung there were many scattered areas, ashen-grey in colour and sharply demarcated from the surrounding tissues. The larger areas were about 2 by 1½ cm., and were roughly polygonal in shape. The light red margins of the consolidated areas were firm and elastic; the deeply coloured solid lung was wooden in consistency and quite elastic; the ashen-grey foci were firm but friable.

The lesions in the right lung were similar to those in the left but not so extensive, and whereas a large portion of the left lower lobe appeared to be occupied by a lesion roughly resembling a massive organizing pulmonary infarct, the lesions in the right lung were smaller and more widely scattered. The sharp demarcation of the ashen-grey areas was just as noticeable in the right as in the left lung.

A few small submucous haemorrhages were found in the body of the stomach and there were recent symmetrical subarachnoid haemorrhages over the convexity of each occipital lobe extending forwards for about 4 cm. from each occipital pole. These haemorrhages were not severe in degree and there was no naked-eye evidence of damage either to the overlying skull and dura or to the underlying brain.

On histological examination of the consolidated lungs the macroscopic changes were seen to be largely the consequence of widespread intra-alveolar capillary haemorrhage. In the dark firm elastic areas the appearances bore a striking resemblance to those found in haemorrhagic infarction. There was the same preservation of the outline and structure of the alveolar walls, the same tight packing of the alveoli with partly haemolysed and rather poorly staining red cells, and the same lack of free tracking of blood through the substance of the lung. There was no microscopic or macroscopic evidence of tracking of air through the lung, as one might expect to find if there had been alveolar rupture of any degree. The general resemblance to infarction and the lack of convincing evidence of widespread alveolar rupture incline us to the belief that the haemorrhage in this case arose from diapedesis or from the rupture of grossly dilated capillary vessels. This view receives some confirmation from the fact that a considerable degree of generalized capillary dilatation was found in sections taken from air-containing parts of the lung unaffected by haemorrhage.

No striking or constant change was observed in the air-conducting system of the lung, but in all sections of the regions showing haemorrhagic consolidation there was a rather striking degree of dilatation of the respiratory bronchioles and alveolar ducts.

An unexpected and rather surprising histological picture was presented by the ashen-grey friable areas lying in the midst of the massive areas of haemorrhagic consolidation. Here every alveolus contained a precisely staining close-meshed fibrin network in the meshes of which considerable numbers of wandering cells and partly haemolysed red cells were lying. The general appearance under the low-power bore a rather striking superficial resemblance to that of lobar pneumonia in the stage of red hepatization.

Closer examination of the wandering cells showed them to be predominantly monocytic. The capillaries in the alveolar walls were considerably dilated, and towards the edges of these areas of pseudo-pneumonic consolidation more and more alveoli were seen to contain coagulated protein with a scantier fibrin network and fewer cells. There was the same general preservation of the alveolar walls in these areas as was found in the frankly haemorrhagic parts of the lung and the same degree of dilatation of the respiratory bronchioles and alveolar ducts.

These appearances bear more than a superficial resemblance to those found in the lung in those cases of rheumatic infection dying of acute cardiac failure which show the condition known as "rheumatic pneumonia."

Sections taken from the peripheral parts of the areas of haemorrhagic consolidation where the lung was firm and airless but bright red in colour showed all alveoli in these zones to be fairly tightly packed with fresh, well-staining, fully haemoglobinized red cells. Wandering cells were absent and there was no fibrin formation. The alveolar walls were for the most part intact.

Discussion

The changes seen in these peripheral areas bore a striking resemblance to the appearances found in the lungs of patients dying soon after exposure to the detonation of high explosive, in which cases recent pulmonary haemorrhages are so often found post mortem. In reviewing a series of post-mortem examinations of seventeen of these cases we have been struck by the variability in extent of these haemorrhages, and it appears reasonable to relate this variation to the period of survival after exposure to detonation. In the case here described the survival period was longer than in any case we have previously observed and the haemorrhagic areas were considerably larger.

These facts should be taken in conjunction with the observation that the areas of haemorrhagic consolidation were surrounded by deep zones of recent bleeding, and we are inclined to believe that patients who develop pulmonary haemorrhages without external trauma to the thoracic wall after the detonation of high explosive continue to bleed into the lung for a period which may amount to forty-eight hours or so.

It would be dangerous to draw any definite therapeutic conclusions from a single case observed for so short a period. It seems probable, however, that on admission the patient was suffering from acute pulmonary congestion bordering on acute pulmonary oedema, and that venesection might well have been performed earlier. The use of concentrated serum was considered, and might have been employed. It also seemed clear that at 5 a.m. the patient passed into a state of "shock" and that the great improvement following venesection had led to a false sense of security. Although he was asleep his blood pressure should have been taken more often, and a plasma transfusion should have been given when it had fallen.

This patient also illustrates the dangers involved in transport by ambulance. When he left thirty-six hours after the explosion his condition had improved and, in the consultation which decided his transfer, he was considered to be quite fit for the journey. When first seen by us his condition was poor and gave obvious cause for anxiety. In the light of the post-mortem finding of continued bleeding it seems clear that these patients should be rested as strictly as if they had had recent severe haemoptysis.

The interpretation of the signs referable to the cardiovascular system is difficult. The bubbling rales in the lungs with dyspnoea and engorgement of the vessels of the neck suggested severe congestion of the pulmonary vascular bed, and this interpretation was supported by the marked improvement after venesection and by the post-mortem appearance of the lung. On the other hand, if there was any change in the blood pressure it was in the nature of a rise, and it is not easy to reconcile this with any serious impairment of blood flow through the lungs.

Summary

A case is reported in which a man aged 23 lived for fifty-one hours after exposure to the detonation of high explosive.

The clinical picture is described and certain suggestions as to treatment are made.

Reasons are given for regarding the pulmonary haemorrhage as being progressive and associated with pulmonary congestion.

Throughout the areas of haemorrhagic consolidation in the lung there were many foci superficially resembling pneumonic consolidation; these are described.

We are greatly indebted to Dr. J. N. O'Reilly for his co-operation in the investigation of this case.

HAEMORRHAGE INTO THE LUNGS IN CASES OF DEATH DUE TO TRAUMA

BY

JOAN M. ROSS, M.D.
Pathologist in the E.M.S.

When changing circumstances bring a lesion to the notice of a morbid anatomist as a manifestation of a new aetiological factor it is well to review the past experience of the lesion and to detail, so far as possible, the variations that have been observed. Under war conditions fatalities have occurred in which the outstanding post-mortem finding has been haemorrhage into the tissue of the lung. Reviewing the peacetime incidence of haemorrhage into the lung in association with death from trauma, it must be recalled that such a lesion may occur in various conditions.

Peacetime Injuries

Blood may be inhaled after haemorrhage from lesions of the upper air passages or nasopharynx, or even from a fracture of the base of the skull. The blood in these cases will be found in the bronchi, bronchioles, and filling the respiratory bronchioles and alveoli in a lobule, giving the appearance of haemorrhagic areas approximately wedge-shaped but with lobulated margins. These bloody foci are likely to be more numerous in the lower lobes. The lung tissue is undamaged, and in the absence of previous pulmonary disease the microscopical appearance is that of normal respiratory bronchioles and alveoli filled with fresh blood. In cases in which the inhalation is not immediately fatal coagulation of the blood will have taken place.

A lacerated wound of the lung associated with haemorrhage may occur after penetration of the chest wall by a sharp object—the spike of an iron railing, a part of a motor-car, or some weapon: a similar condition in the lung is produced by a broken rib if driven inwards. The appearances here vary according to whether the penetrating object or rib remains in the lung while respiration continues. The pleura being damaged, there will probably be a pneumothorax and probably also a haemothorax. The injury to the pleura and gross disruption of the tissue of the lung are usually apparent on naked-eye examination. The resultant haemorrhage into the lung varies with circumstances. It may spread for some little distance beyond the margins of the wound.

Haemorrhagic lesions (contusions or bruises) of the lung may be found in cases which show no penetrating wound of the chest and even those in which no ribs are broken and no injury to the chest wall is apparent. Such cases are comparatively frequent in road accidents: they may be found after the violent impact of a moving vehicle or when the victim is hurled against a hard obstacle such as a wall. In children it is most often associated with a history of the rapid passage of a wheel over the thorax. The presence of extensive internal injuries without external evidence of violence is much more common in children than in adults. The haemorrhagic lesion in the lung takes the form of a contusion or localized bruise of some part of the organ, the localization being determined by the direction of the force and the situation of the maximum point of impact on the chest wall. Quite often there is a separation of the lung tissue where the organ has been nipped against the vertebral column. Scattered multiple haemorrhages are infrequent. As a rule there is no associated emphysema, but patients surviving for a few minutes may show all grades of interstitial emphysema when the lung is severely contused. Haemothorax is quite common. Microscopically there is rupture of the lung tissue and haemorrhage into the damaged area.

In another group of cases death may be said to be due to asphyxia. It has been recognized since Tardieu's time that asphyxia from any cause produces haemorrhagic lesions in the lungs. The lesions consist of punctiform subpleural haemorrhagic patches. They are dark in colour and vary in size from 1 to 5 mm. in diameter. Sometimes they are larger. These ecchymoses—Tardieu's spots—are sometimes separated, sometimes in groups. The outline is generally distinct and well defined on the surface. They are most common about the root of the lung at the lower margin and on the pleural surfaces between the lobes. They are usually associated with similar lesions on the other serous surfaces—the pericardium and the peritoneal surface of the diaphragm, etc.—and in the thymus in children. On suffocation the lungs will show congestion as well as Tardieu's spots. In asphyxia due to pressure on the trachea (strangulation) there will be frothy blood-stained mucous fluid in the upper air passages and intense congestion of the lungs, and, in addition to Tardieu's spots, larger patches of haemorrhages may be present in the substance of the lung. Where there has been continued compression of the thorax the haemorrhage into the tissue of the lung will be greatest where the ribs have pressed against the pleura.

Another type of case in which localized haemorrhagic lesions have been said to occur is that in which fat embolism is the cause of death. With reference to this it may be stated that it is not the experience of most morbid anatomists who have dealt with any numbers of deaths of a violent nature that fat embolism of the lung produces any localized haemorrhagic lesions which can be distinguished macroscopically. The lungs of patients dying of fat embolism following crushing injury to the bones, joints, or adipose tissue are typically deeply congested throughout, with no localized haemorrhagic patches.

Wartime Injuries

Having reviewed the haemorrhagic lesions of the lung due to trauma as they were seen in peacetime, it remains to compare the lesions produced as the result of the detonation of high explosive. It is possible to place some cases in the groups already summarized.

Flying missiles—bomb-casing and secondary mobilized fragments of masonry, metal, or wood—produce penetrating wounds of the chest and lacerated wounds of the lung differing in no way, except in degree, from those lesions described above. Impact damage from these missiles, or forcible hurling of the victim by the force of the explosion ("blast"), may produce contusions of the lung such as are all too familiar in road accidents. These contusions may presumably be found without visible external injury.

Cases of asphyxia are probably frequent under conditions due to bombing, where casualties may be buried under debris. These cases may be considered in two groups: in the one there has been inhalation of a large amount of dust; in the other the victim has been pinned under a pile of debris. In the former group the post-mortem findings are those of asphyxia only. Cyanosis is present; frothy mucus may be mixed with the solid inhaled material; and the lungs show congestion and some small scattered haemorrhages throughout and Tardieu's spots on the pleural surface. These ecchymoses are found in varying numbers under the parietal pleura and on the

peritoneal surface of the diaphragm. The other group is of considerable interest as it is possible to construct from examination of these cases a picture of the lung changes in compression asphyxia.

In cases of compression asphyxia where the victim has been buried under debris death has presumably been slow, with attempts at respiration. In such conditions rib markings have been observed; a dark purple line of the size and direction of the rib is seen, with emphysematous bullae visible at the margin of the dark rib marking. In addition these cases showed some scattered haemorrhages into the lung, with subpleural Tardieu's spots. There are localized areas of collapse. Microscopically there is disruption of the alveolar walls where the rib marking has been sectioned. There is fresh blood in the alveoli, and clotting may have begun in some areas. Elsewhere there is general congestion of all the capillaries in the alveolar walls and a considerable number of thromboses in smaller arterioles and veins. Oedema is present in many areas.

So far it has been possible to correlate these wartime injuries with peacetime parallels. Another group is without parallel. This includes cases in which death may be found to have occurred without or with only trifling external injury, but in which intrapulmonary haemorrhage has been a post-mortem feature common to them all. These cases have all been found near to the site of explosion of a bomb. In view of this fact the condition may well be called "haemorrhagic pulmonary concussion"; it may or may not be due to blast from the high explosive. It may prove to be of interest in the elucidation of the actual causes of this concussion that where these pulmonary lesions have been found and there have been external markings of small splinters, etc., the superficial lesions have all been on the anterior surface of the body.

Subpleural haemorrhages are not conspicuous and haemorrhagic rib markings are not present in the pleura. The haemorrhagic areas are scattered through, and often deep in, the substance of the lung, most often posteriorly and towards the base. The degree of haemorrhage varies considerably, but both lungs are affected to the same degree.

Comparing the histology of these cases with that found in compression asphyxia, it is seen that oedema is not a feature. Thromboses are not present. The haemorrhage in those patients found dead is fresh, and clotting has not occurred. There is widespread and intense capillary congestion in the lungs. There is haemorrhage into the walls of the small bronchioles, but absence of bleeding into the walls of the bronchi. There is some over-distension of air vesicles and respiratory bronchioles in some cases, but there is no anatomical relation of these to the ribs.

At the present time it is not known how many of the air-raid casualties dying with gross fatal injury, apparent externally, show pulmonary lesions such as these, but it is beyond question that these appearances are a definite morbid entity distinct from conditions hitherto familiar, and are distinguishable on careful analysis from lesions due to compression asphyxia or to pulmonary haemorrhage due to impact of solids against the thoracic wall.

Conclusion

The main points of difference may be summarized as follows:

In compression asphyxia the lesions may be symmetrical on both sides, but not necessarily so. The haemorrhages are usually subpleural and in the lines of the ribs. Emphysema may outline these rib markings. There is generalized congestion of the lungs and some oedema. Tardieu's spots are nearly always found.

In haemorrhage due to impact of a solid the haemorrhage is in relation to the point of maximum impact and may be unilateral. The lung tissue is contused, torn, and filled with blood at or around this point.

In haemorrhagic concussion the lesions are always bilateral and roughly symmetrical. There is general congestion of the lungs. Pleural haemorrhages are present only as an extension from deeper areas.

FAMILIAL PERIODIC PARALYSIS

BY

J. MacDONALD HOLMES, M.D., M.R.C.P.

Physician, Staffordshire General Infirmary; Major, R.A.M.C., Medical Specialist

The following brief study of two cases of familial periodic paralysis is recorded because of the rarity of the disease. The patients were brothers recently enlisted in different units, and their disability was first noticed after exercise. The chemical investigations were limited by military conditions and are by no means complete.

Familial periodic paralysis is characterized by sudden attacks of flaccid paralysis in one or more muscle groups, generally in the limbs. The paralysis is usually symmetrical. The trunk muscles are seldom involved, and much more rarely the muscles supplied by the cranial nerves. There is a complete loss or diminution of the tendon reflexes in the affected muscles, and usually the electrical excitability to both faradic and galvanic currents is lost or diminished. The duration of the attacks varies from a few hours to three or four days. They vary greatly in frequency, occurring every few days or at intervals of several months. Sphincter control is rarely affected, and very infrequently death occurs from respiratory paralysis. Biemond and Daniels (1934) have described a muscular atrophy developing in later life in the muscles most affected by the paralysis, but this complication is rare. There is usually little difficulty in diagnosing the cases with a familial incidence, but occasional sporadic cases occur which may be regarded as hysteria.

Until recently the factors causing the disease, apart from the inherited predisposition, have remained obscure. The first real advance in the understanding of the condition was made by Aitken, Allott, Castleden, and Walker (1937). These observers found that during the attacks of paralysis there was an abnormally low serum-potassium level and that the paralysis could be cut short by the administration of potassium chloride by mouth. They also found that paralysis could be induced by giving large amounts of glucose by mouth, either alone or together with insulin injections. These observations were confirmed in two further cases by Allott and McArdle (1938).

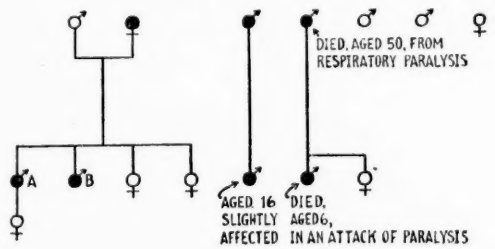
The fall in the serum-potassium content had been observed by Biemond and Daniels (1934), but they did not realize its significance. Treatment with potassium salts was mentioned as early as 1902 by Mitchell, Flexner, and Edsell, also by Holtzapple in 1904, and by Herrington in 1937. Holtzapple used potassium bromide, and ascribed the benefit to the bromide rather than to the potassium. Herrington used potassium citrate in 5-gramme doses with success in two cases.

In the first case here recorded the attacks of paralysis could be induced by giving large doses of glucose. During an attack the serum-potassium level was found to be low. Potassium salts by mouth caused a rapid disappearance of the paralysis, with a simultaneous rise in the serum-potassium level. Attempts to induce paralysis in the second case were unsuccessful, and apart from the history there is no definite evidence that this patient suffered from the disease.

Case I

Gunner A, aged 26, was admitted to hospital with flaccid paralysis of the arms and legs following a strenuous day of physical training. When seen the paralysis had almost recovered, but he stated that he had had similar attacks since the age of 15, occurring at varying intervals, usually of a few weeks. All four limbs are paralysed during the attacks and often the muscles of the back as well. Speech is not affected, but occasionally swallowing is difficult. Severe exercise will bring on an attack the following day. He also states that a few glasses of beer will precipitate an attack. The paralysis lasts for three or four days as a rule, and some residual stiffness and aching persists in the affected muscles for about a week afterwards. He has warning of the onset in the form of a "tight feeling" in the arms, legs, and back. He feels very thirsty during an attack, but not hungry. No palpitation or dyspnoea has occurred, nor has there been any loss of sphincter control.

His mother is slightly affected, but with advancing years her attacks have practically disappeared. One brother (Case II) is affected. The accompanying family tree shows that seven members of the family are known to have been affected; these are shown in black.



A complete physical examination revealed no abnormality during a period of freedom from paralysis. There was no muscular wasting, and all the tendon jerks were brisk. The electrical reactions of all the muscles were normal. The administration of glucose in 50-gramme doses with 25 units of insulin three times a day did not induce paralysis, nor did the injection of adrenaline in 5-minim doses half-hourly for twelve hours.

On April 2, 1940, 200 grammes of glucose was given at 10 a.m. An attack of paralysis began about 1 a.m. the following day. Weakness was maximal in the upper arms, back, and legs. The forearms were only slightly weak and toe-wriggling movements could be performed. All the tendon jerks were absent with the exception of those of both triceps and the knees, which could just be elicited. The pulse rate remained unchanged, the blood pressure was 130/75. There were no sensory changes apart from tenderness and aching of the muscles involved. Twelve grammes of potassium chloride was given by mouth at 10 a.m. on April 3. The paralysis had completely disappeared by noon, but some stiffness and aching remained. The tendon jerks all reappeared as the paralysis was passing off. The potassium chloride produced severe nausea, so it was decided to use potassium citrate on future occasions. A fractional test meal showed a normal secretion of free hydrochloric acid, and a glucose-tolerance curve was normal.

On April 17 another attack of paralysis was induced by giving a further 200 grammes of glucose at 10.30 a.m. As before, the onset of paralysis was about 1 a.m. the following day. The serum-potassium level at 10 a.m. on the 17th was 18.9 mg. per 100 c.cm. On this occasion all the tendon jerks disappeared, and the electrical reactions were present but sluggish in the affected muscles. Serum-potassium and blood-sugar estimations were made during the period of recovery and the following figures were obtained:

	Serum Potassium	Blood Sugar
April 18:		
10.30 a.m.	12 mg. per 100 c.cm.	110 mg. per 100 c.cm.
15 grammes of potassium citrate then given. Rapid recovery followed.		
11 a.m.	18 mg. per 100 c.cm.	
11.30 a.m.	21.8 ,, ,, ,, ,,	110 mg. per 100 c.cm.
12 noon	23.3 ,, ,, ,, ,,	
2 p.m.	20.1 ,, ,, ,, ,,	90 ,, ,, ,, ,,

The tendon jerks were present at 11 a.m. and had fully returned at 2 p.m.

The urinary excretion of potassium was estimated during the two days covering the period of paralysis and the following figures were obtained:

	Urinary Excretion of Potassium
April 17:	
Between 10 a.m. and midnight	0.19 gm.
April 18:	
Between midnight and 10.30 a.m.	0.172 gm.
,, 10.30 a.m. and 2.30 p.m.	0.126 gm.
,, 2.30 p.m. and 9.30 p.m.	2.964 gm.
,, 9.30 p.m. and 5.30 a.m.	1.5 gm.

Case II

Private B, aged 23, the younger brother of Gunner A, stated that his first attack of paralysis occurred at the age of 17. The attacks are infrequent and by no means as severe as those of his brother. They are brought on by severe exercise, and he has had one attack since he joined the Army—following a long route march. As in Case I, the paralysis usually occurs when he is in bed at night, and when severe it lasts for two or three days. He has no premonitory signs or symptoms.

On April 26 physical examination revealed no abnormality. All attempts to induce an attack of paralysis failed. Glucose alone, glucose with insulin, and adrenaline did not cause the slightest muscular weakness. The following serum-potassium and blood-sugar estimations were made:

	Serum Potassium	Blood Sugar
April 29:		
1.30 p.m.	24 mg. per 100 c.cm.	116 mg. per 100 c.cm.
200 grammes of glucose then given by mouth		
2.45 p.m.	25.7 mg., but some haemolysis had occurred	
3.15 p.m.	21.9 mg. per 100 c.cm.	116 ,, ,, ,, ,,
4.15 p.m.	21.9 ,, ,, ,, ,,	116 ,, ,, ,, ,,
7.15 p.m.	19.36 ,, ,, ,, ,,	110 ,, ,, ,, ,,
11.30 p.m.	16.98 ,, ,, ,, ,,	
April 30:		
8.30 a.m.	21.9 ,, ,, ,, ,,	
2.15 p.m.	22.5 ,, ,, ,, ,,	

The investigation of this case was not pursued further.

Commentary

The low level of the serum-potassium content during the period of paralysis in Case I and the rapid recovery following the giving of potassium salts by mouth correspond with the observations of Aitken, Allott, Castleden, and Walker (1937) and Allott and McArdle (1938). The estimations of the urinary excretion of potassium, although incomplete, suggest that there was a retention of potassium in the body during the period of paralysis and its onset.

Ferrebee, Atchley, and Loeb (1938), and Pudenz, McIntosh, and McEachern (1938) showed that potassium is retained in the body during the attacks of paralysis. Gammon, Austin, Blithe, and Reid (1939) have shown that in the late hours of the night potassium excretion

was unusually low and that water diuresis rapidly washed out potassium from their patient, with a fall in the serum potassium and development of paralysis. Pudenz, McIntosh, and McEachern found that if the venous return of one arm was obstructed the injection of potassium chloride into an artery of the limb did not produce a return of function. If, however, the circulation of the limb was completely obstructed injection of potassium chloride into the other arm produced a return of function equally quickly in both limbs. They therefore suggested that a central factor may be at work. It has been shown that intravenous injection of choline esters such as doryl and mecholyl will cut short an attack of paralysis without the administration of potassium, and that after these drugs the serum potassium rises.

An interesting similarity to the action of potassium in familial periodic paralysis occurs in myasthenia gravis. Laurent and Walther (1935) first showed that potassium salts were a valuable adjuvant to prostigmin in the latter condition and might even replace it in some cases. Cumings (1939, 1940) has shown that there is a retention of potassium in the muscle substance during the periods of weakness in myasthenia gravis.

Our knowledge of the mechanisms involved in the causation of attacks of familial periodic paralysis is still very incomplete, but the available evidence suggests that an abnormal metabolic process in the muscle fibres is responsible, and not any central factor in the nervous system. Allott and McArdle (1938) found that the phosphorus metabolism runs parallel with that of potassium and suggest that a quantitative or qualitative disturbance of hexose phosphate metabolism is involved. The similarity to myasthenia gravis suggests that there may be common factors in the two conditions.

The serum potassium was estimated colorimetrically by a cobaltinitrite precipitation method. The same method was applied to the urine after making it alkaline and removing the ammonia by adding formaldehyde.

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Dr. John E. Gordon, Professor of Preventive Medicine and Epidemiology at Harvard University, has made a brief statement of his plans for setting up in this country the American Red Cross Harvard Hospital for Infectious Diseases. The plan envisages three distinct activities: (1) the hospital proper for the care of patients; (2) research laboratories for the study of clinical problems and epidemiology; (3) field study in epidemiology and infections diseases. Dr. Paul V. Beeson, formerly of the Rockefeller Institute Hospital in New York, will be in charge of the hospital; Dr. MacNair Scott, Research Professor of Pediatrics at the University of Pennsylvania, will supervise the laboratory work; Dr. John Mote, Assistant in Epidemiology at Harvard Medical School, will undertake epidemiological investigations; and field studies will be under the direction of Dr. Dean Fleming of the Harvard School of Public Health.

SOME PUBLIC HEALTH CONSIDERATIONS CONSEQUENT UPON A LARGE-SCALE AIR RAID

BY

ARTHUR MASSEY, M.D., D.P.H.

Medical Officer of Health, City of Coventry

The enemy air raid on Coventry on the night of November 14–15, 1940, was of great severity and the casualties were heavy. Damage to property in the city was widespread and included much injury to drainage, sewerage, and water communications. The social disturbance as affecting the lives and habits of the civil population was considerable, and, following the raid, evacuation—official and private—was on a large scale. This was due to the big number of damaged houses temporarily uninhabitable and to the hazard of further raids. In addition to the "complete" evacuees there was a larger number of those who continued to work in the city by day and to sleep elsewhere. The still commendably large residual adult population who "stuck it" in the city have had to take to shelter life to a greater extent than obtains in areas hitherto comparatively free from bombardment. All these things have brought momentous public health considerations in train, notably in the spheres of epidemiology, hospital policy, mental health, and housing. In these connexions the following brief notes may be of interest.

Epidemiological

In view of damage to drainage and water mains the typhoid hazard was obvious, and the preventive measures adopted included (*a*) persistent local propaganda urging the boiling of drinking-water and milk; (*b*) the chlorination of water supplies; (*c*) special injunctions to and supervision of makers and purveyors of foodstuffs in regard to cleanliness; (*d*) all possible steps to secure the early restoration of water-pipes, sewers, and drains; and (*e*) arrangements for large-scale anti-typhoid inoculation.

In regard to (*a*), Press, posters, and Ministry of Information loud-speaker vans were used. The absence of gas supplies in many parts of the city added difficulty to the boiling of water and milk, but the public nevertheless took the matter seriously and resorted to open fires for boiling.

Immunization against Typhoid.—The view of the Ministry of Health in regard to mass immunization against organisms of the typhoid group is that there is no occasion for it unless conditions should arise which, in the opinion of the medical officer of health, render it necessary. The conditions which arose in Coventry following the big raid were exactly such as presumably were meant when the latter proviso was inserted.

Immediately after the raid three immunization clinics were opened at convenient points in the city—namely, at two hospitals and at a large central first-aid post. In addition one of the mobile first-aid units was commissioned temporarily as a mobile immunization clinic. These clinics were conducted by medical and nursing personnel of the public health department. Arrangements were made for the employees of large factories to be inoculated at the factories. The immunizing material was supplied free by the department, and the firms concerned contracted with private medical practitioners for the inoculation work. The campaign was well advertised by Press, posters, and loud-speaker vans. The immunizing material

used was Lister Institute anti-typhoid–paratyphoid A, B, and C vaccine, supplied through the Ministry of Health. In addition a certain amount of Evans Sons Lescher and Webb's anti-typhoid–paratyphoid A and B vaccine was employed. The injections were made subcutaneously in the left upper arm. During the first three weeks following the raid the numbers of persons immunized were: At the clinics, 2,364; in the factories, 13,417; privately, 505. The work is still proceeding apace, although the law of diminishing returns is beginning to assert itself. Notably in regard to workers in factories, there was some little apprehension at first regarding the possibility of loss of working time owing to reactions. The inoculations were done at times which minimized this possibility, and in fact initial misgivings proved to be unwarranted.

Shelter Dangers.—Much has already been written in regard to the unhappy epidemiological potentialities of shelter life. The danger applies fully in a proven target area where, since raids began, shelter life is regular and general. In such an area the risk of an unusual incidence of diphtheria, cerebrospinal fever, influenza, and the like is real. Measures of prevention in the shelters may be classified as environmental, supervisory, and educative. The best general measure is a strong evacuation policy applied to women and children. So far as diphtheria is concerned mass immunization of children is in any case important and necessary. The open phthisis case is a constant problem in public shelters, and the medical or nursing adviser should essay to secure that infectious cases of this kind refrain from using the shelters. Dispersal in small shelters as opposed to concentration in large ones would do much to counter the spread of infections, but, of course, many other important considerations must influence shelter policy.

Baths.—The Coventry raid seriously interfered with supplies of water to the public baths, and the bathrooms of a large number of damaged houses were of course unusable—just at a time when bathing facilities were especially necessary to help to counter possible infections and parasitic conditions. Water-supplies were quickly restored to the undamaged first-aid posts, however, and the shower-baths in the decontamination units there were made available to the public and were much used. Requests were made to the factories possessing similar facilities to throw them open to workers and their families, and a good response was forthcoming. The local policy of providing rain-water tanks in connexion with house property proved its value, for in many homes where the town's water was cut off rain-water was still available for washing purposes.

Hospital Policy

If further evidence were needed in favour of peripheral as opposed to central sites for hospitals connected with large towns air-raid conditions have supplied it. In Coventry the two large general hospitals are situated centrally, and both sustained damage in the big raid. Owing to the extensive damage the number of beds has been so reduced that each hospital constitutes only a casualty clearing station together with a pool of beds for the temporary accommodation of ordinary acute cases pending evacuation as the pool fills up. The scheme of affiliated outer base hospitals, as planned for the region by the Ministry of Health, has proved invaluable, and the evacuation and other arrangements have worked smoothly under test. It was fortunate that the central hospitals in Coventry had been largely evacuated in readiness before the big raid came. The provision of peripheral in place of central casualty clearing stations may well be a future requirement.

At present the committee of the city's large voluntary hospital is concerned about the future of the hospital, which sustained very extensive damage. All are agreed that full restoration on the existing central site is contra-indicated so long as air-raid risks continue. On the other hand, are the large and excellent administrative and clinical resources of the hospital to be employed only in the restricted sphere of an institution with less than a half of its former beds? The solution is likely to be found in two ways—namely, (*a*) by employing certain resources in the general hospital services of the region, and (*b*) by taking over some large block of buildings in an outside area and staffing and equipping it as a branch of the central parent hospital.

Mental Health

During and shortly after the raid many cases of mental distress found their way to the first-aid posts, for rest and sympathy. They can best be described as having been "stunned" by events. In the main their condition soon became normal. On the whole the reaction of the population was one of calm defiance. Doubtless there was a proportion of neurotic subjects, notably among the hasty evacuees. Actually there has been a decrease in the numbers of patients attending the psychological out-patient clinics held twice weekly in the city. This is probably due to (*a*) the decrease in the city population due to evacuation, and (*b*) the likelihood that the clinic patients—actual or potential—were among the first to evacuate. Nevertheless it cannot be said that there is evidence of any notable increase in the incidence of neurosis. Coventry has suffered many previous raids, and it may be that these served to eliminate the more nervous people by evacuation prior to the big raid.

Housing and Feeding

The number of persons homeless owing to the raid was very considerable. These were immediately provided for through the city's emergency rest and food centres, pending more permanent housing arrangements in outside billets and hostels or with relatives and friends. In the latter connexion travel vouchers were issued to a large number to enable them to reach the homes of those willing to accommodate them in other areas.

The damage to houses was in some cases heavy in areas which in normal times would be the subject of slum-clearance measures. In this respect the raid will have some salutary repercussions. It has in fact given to Coventry a unique opportunity for future big-scale replanning on healthy lines, and there is every reason to believe that the opportunity will not be lost. Meanwhile first-aid repair to houses which properly admit of it is in full progress. In connexion with reconstruction works, hostels have been and are being provided for imported workers.

Even at the height of the city's difficulties there was no serious shortage of food, which was brought in under efficient Government arrangements and dispensed through the city's many feeding centres. The situation was assisted by mobile canteens operated by various voluntary organizations. For some days normal milk supplies were held up, and local stocks of dried milk were of particular value. After the raid an important task was that of food salvaging from damaged shops, stores, and hotels. This was collected and sorted by competent inspectors into the three categories—(*a*) fit for human food; (*b*) fit for animal food only; and (*c*) unfit for any use—and was disposed of accordingly. A common cause under category (*c*) was contamination with small particles of broken glass.

At the time of writing (December 16) services have been largely restored, and among the population stabilizing forces are in full evidence. As their houses are repaired the occupants are returning. There has been no outbreak of infectious disease up to date.

INOCULATION WITH T.A.B.C. VACCINE IN SOUTHAMPTON

ANALYSIS OF REACTIONS

BY

H. C. MAURICE WILLIAMS, M.R.C.S., L.R.C.P., D.P.H.

Medical Officer of Health, Southampton

In September, 1940, we initiated in Southampton a campaign to protect the civilian population against the typhoid group of fevers. The response of the public has been encouraging, particularly among the employees of the larger commercial firms, in some of which we have achieved as high an acceptance rate as 80%. It is interesting to note that, although on occasions the local and constitutional reactions caused discomfort, the number of persons who did not return for a second injection was under 1%.

Some local authorities have refrained from carrying out mass inoculations owing to the possible loss of working time among the manual workers in essential war production. An editorial in the *Medical Officer* discredited such a scheme, on the assumption that every person receiving inoculation would be incapacitated for forty-eight hours, and considered that the resultant loss of working days would far outweigh the time lost through the disease. This conclusion was based on the incidence of the disease in peacetime. For this reason I have noted with care the reactions and loss of working time among those who have received the inoculations. Unfortunately it has not been possible to ascertain to the same degree the reactions following the second injection, but from a large number of people who have been interrogated we find that these show little difference.

The Lister Institute T.A.B.C. vaccine was used in the following doses, with fourteen days' interval between the first and second injections: men, 0.5 c.cm. and 1 c.cm.; women, 0.3 c.cm. and 0.6 c.cm. In analysing the reactions males and females have been divided into manual and sedentary workers, and the reactions classified as follows:

1. Slight local reaction—stiffness of the arm with local redness for a period lasting up to forty-eight hours.

2. Severe local reaction—pain and stiffness exceeding forty-eight hours, with redness and swelling extending more than two inches from the site of injection.

3. General reaction. This took several forms, the most common being a feeling of malaise, nausea, giddiness, shivers, and 'flu; it included in a few cases abdominal pain, with diarrhoea, vomiting, and occasional erythematous or urticarial rashes, the last-named being more marked in allergic subjects.

4. Combined reactions: one of the local reactions with a general reaction.

5. No reaction.

Many of the larger firms desired to have their employees split into groups, owing to the possible dislocation of work by incapacitation, but it is shown that among the 10,032 persons investigated the total loss amounted to only thirty days, and no working time was lost by a total of 1,872 male manual workers. Children over 3 years of age receiving the appropriate dose did not show any severe reactions, and in many cases protection against diphtheria was given at the same time without any bad result. It was also noted that those who had severe general reactions usually had mild local reactions.

Analysis of Reactions following the First Injection

Reactions	Females		Males		Total
	Sedentary Workers	Manual Workers	Sedentary Workers	Manual Workers	
Slight local	1,707 (61.45%)	1,766 (67.8%)	1,592 (57.2%)	1,188 (63.4%)	6,253
Severe local ..	50 (1.85%)	70 (2.6%)	38 (1.3%)	50 (2.7%)	208
Combined reaction ..	766 (27.6%)	594 (23%)	992 (35.7%)	508 (27.2%)	2,860
No reaction	253 (9.1%)	172 (6.6%)	160 (5.8%)	126 (6.7%)	711
Number inoculated	2,776	2,602	2,782	1,872	10,032
No. of working days lost	8	7	15	—	30

Before the heavy raids on Southampton between 3,000 and 4,000 persons attended for inoculation each week, but the interruption of the clinic services occasioned by these raids upset the routine, and we are now making use of the mobile first-aid units. These are stationed in different parts of the town every afternoon, and the number of persons attending shows a daily increase. It is of great importance that if large numbers of persons are to be protected in a town a medical officer should be sent to the places of employment, as workers find it difficult to attend public clinics before the early black-out.

Clinical Memoranda

Congenital Obliteration of Bile Ducts with Total Transposition of Viscera

I have failed to trace any references to congenital atresia of the bile ducts occurring in association with complete transposition of the viscera, hence my desire to record the following case. I have found reports of cases in which congenital obliteration of the bile ducts has been described in association with the transposition of some of the viscera, but in none of them does the transposition seem to have been total.

CASE REPORT

A full-term female child—weight 7¾ lb. at birth—was admitted when 6 months old to the Devon and Exeter Hospital bearing the label "icterus neonatorum." The history was that she had been "yellow" since birth. This "yellowness" had steadily increased in intensity, and about six weeks previous to admission the abdomen had gradually become swollen, followed by swelling of the legs and feet; otherwise, according to the parents, the child had been healthy and normal in every way. She was the second of the family, the elder child being perfectly healthy. The father and mother were both healthy and normal. No instance could be elicited of a similar condition in the family history.

On admission the temperature was 99.2°, the pulse 120, and the respirations 48. The infant was well nourished, somewhat anaemic, had marked distension of abdomen, with a moderately intense icterus which involved the whole body, including the conjunctivae. I was unable in my interrogation of the parents to find out whether the jaundice had first appeared in the skin or in the conjunctivae. Both legs were

oedematous and swollen, and there was a haemorrhagic area in the skin on the antero-lateral aspect of the right wrist. The buttocks and labiae were swollen, excoriated, and red. On palpation both liver and spleen seemed to be enlarged. The presence of intraperitoneal fluid was demonstrable.

There was no apex beat visible or palpable on the left side. On auscultation it was discovered that the usual heart sounds heard over the mitral area could be heard much better over a corresponding area on the right side. This led to palpation on the right side, and a faintly palpable beat could be found in the region of fourth and fifth ribs. Dextrocardia was postulated and confirmed at necropsy. There was some dullness in both lung bases, otherwise nothing abnormal was detected in the respiratory system. No evidence of haemorrhage from the umbilical cord was seen nor had the parents noticed any. Stools were, in jaundice parlance, "putty-like." The urine was deeply stained and there was no epistaxis.

A blood examination showed: red cells, 4,240,000 per c.mm.; haemoglobin, 76%; colour index, 0.9; white cells, 62,400 per c.mm.—polymorphonuclears, 61.5%; lymphocytes, 37%; transitional neutrophils, 1%; eosinophils, 0.5%. There was anisocytosis of the red blood cells—some of which were polychromatic—and occasional punctate basophilia. Seven nucleated red blood cells (normoblasts) were seen while counting 200 white blood cells.

The child lived for two days after admission, then died; the temperature having previously risen to 103°.

Post-mortem Examination.—Apart from some congestion, no cerebral abnormality was found. On opening the thorax complete transposition of the heart and lungs was observed. Transposition was also found in the abdomen, including the kidneys (as judged by the shape of the suprarenal glands). The heart and lungs showed no other abnormality. There was half a pint of blood-stained fluid in both pleural sacs, and about a pint of straw-coloured fluid in the abdomen. The liver was markedly enlarged, hard, tough, and greenish in colour (obstructive biliary cirrhosis). In the position of the gall-bladder there was a thin-walled cyst containing clear greenish-yellow fluid; this, I think, was the gall-bladder—it was about the size of a tangerine. What appeared to be the cystic duct was a fibrous cord lying between the cyst and the liver; it had no connexion with the cyst. The common bile duct could not be traced. The spleen presented a curious condition: there were no fewer than twenty-two splenunculi.

I would like to thank Dr. Seward, honorary assistant physician to this hospital, for permission to report the case, and Dr. Robb, pathologist, for his help and encouragement.

MALACHY J. SMYTH, M.B., B.Ch., B.A.O.,
House-physician, Royal Devon and Exeter Hospital, Exeter.

A Note on the Gastro-Ileac Reflex

An increase in the activity of the colon after the taking of food is a physiological process which is an everyday experience. It is not so well known that a similar reaction occurs in the lower ileum. The term "gastro-ileac reflex" was given to the phenomenon by Sir Arthur Hurst in 1913, although Sir William Macewen described it in 1904.

Observations by Douglas and Mann (1939, 1940) in the dog seemed to indicate that the reaction was not confined to the ileum but occurred also in the jejunum, and, furthermore, depended for its mediation not on the extrinsic nerves of the intestine but on the continuity of the lumen of the intestine. Through the kindness of Prof. Grey Turner I have had the opportunity of studying the reaction in a patient in whom a caecostomy had been established as a preliminary to resection of a colonic carcinoma.

So far as I am aware no record of the reflex has been taken in man. Accordingly a simple air-displacement system was devised, consisting of a small balloon cemented to a gum-elastic catheter, a water manometer, and a recording tambour with a writing lever. The system was connected by pressure tubing. The record was taken on a slow kymograph. The balloon was inserted through the ileo-caecal valve into the ileum for a distance of about nine inches. It was held in position by the patient, the semi-rigidity of the catheter preventing its expulsion. Food was withheld for four hours. The balloon was inflated to a water pressure of about 6 cm., and a control tracing taken. A meal was then given, the tracing being continued.

In the patient, as in the dog, the taking of food was rapidly followed by a well-marked increase in activity (see Figure). At the same time the small-bowel contents were expelled past the balloon into the caecum. It is of interest to note that the time relation of the reaction is similar to that in the dog. The function of the response is probably excretory. The gastro-colic reflex is often followed by defaecation, and it is probable that the gastro-ileac reflex represents defaecation of the small bowel into the colon.

Acknowledgment is made to Dr. Allen Daley, Chief Medical Officer to the L.C.C., for permission to publish this observation.

D. M. DOUGLAS, M.S., Ch.M., F.R.C.S.,
First Assistant in Surgery, British Postgraduate Medical School.

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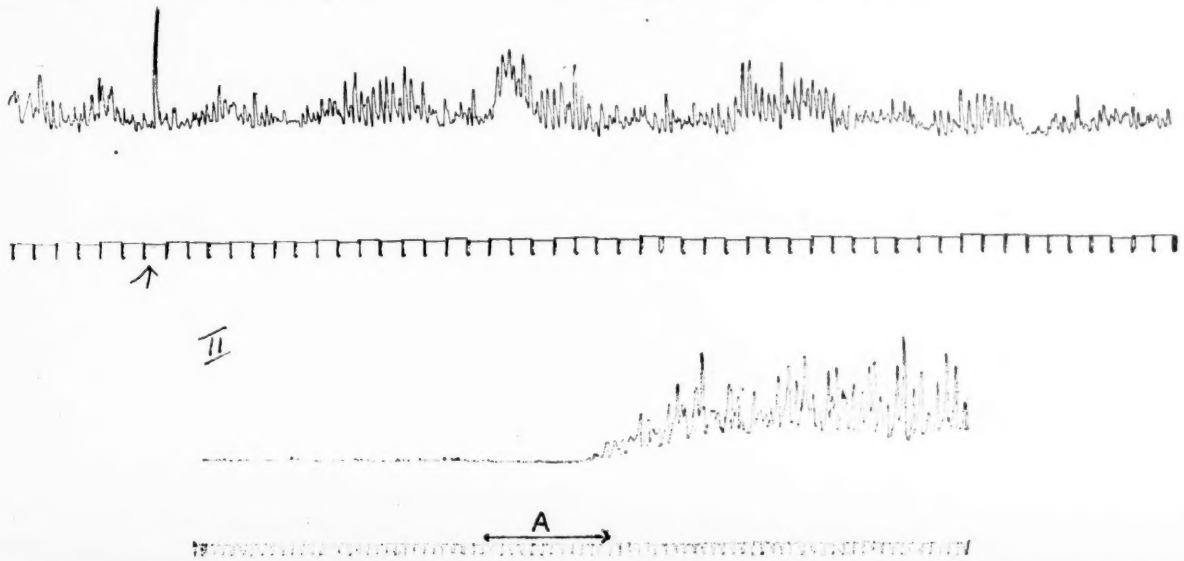

The gastro-ileac reflex in man (upper tracing) and dog (lower tracing). The time intervals in the human tracing are 30 seconds, in the dog 5 seconds. The large excursion in the human tracing immediately after the feeding signal is an artefact caused by the patient's moving while eating.

Reviews

MALIGNANT DISEASE

Malignant Disease and its Treatment by Radium. By Stanford Cade, F.R.C.S. (Pp. 1,280; with 623 illustrations, many in colour. 75s. net.) Bristol: John Wright and Sons, Ltd.; London: Simpkin Marshall, Ltd. 1940.

This book fills a long-felt want and is assured of a hearty welcome. Any one man might well shrink from the attempt to draw the picture of cancer as a whole, for the subject demands at the very least full knowledge of the pathology and natural history of cancer, the wisdom of the experienced general surgeon, and a detailed understanding of the physics and biophysics of radiant energy. Everyone concerned in the treatment of cancer will be under a great debt to Mr. Stanford Cade for succeeding in so immense an undertaking.

The first part of the book contains in a hundred pages a full, accurate, and readable account of radio-activity and radium dosimetry. H. T. Flint, C. W. Wilson, and L. H. Gray have contributed chapters which will enable the clinician to understand the physical principles governing the use of radium, and so, in full co-operation with the physicist, be so much better equipped to treat the patient with cancer.

In the second part of nearly 200 pages the biological effects of radiation are presented in clear and connected detail, and the wealth of references is never allowed to interfere with the continuity and the clinical significance of the facts described. Where all is so good the account of the much-neglected radium burn is outstanding: "It is neither inevitable nor is it of any therapeutic value. It denotes as a rule errors of technique or errors of judgment." The quotation well illustrates the author's vigorous and easy style, which makes the reading of the book as pleasurable as it is profitable.

The third part starts with a succinct account of the limitations of surgery and of the value of radiotherapy, and the author pays his tribute to the pioneer work of the Paris Radium Institute, the Stockholm Radiumhemmet, and the New York Memorial Hospital. If the soundness of their principles had been earlier recognized in England the years spent in using radium for clinical research in general hospitals by methods of trial and error might well have been avoided.

Malignant disease is then considered in every site of the body, a chapter to each: its natural history, clinical types, symptoms (with particular emphasis on the early symptoms as distinct from the textbook descriptions of established disease), histology, local and distant metastases, course, and termination. Next the diagnosis and differential diagnosis are discussed, and then the choice of the method or methods of treatment. The emphasis is always on the value of combined methods of treatment—surgery, surgical diathermy, *x* rays, and the various kinds of radium treatment; the right sequence as shown by experience is indicated, and the technique of radium treatment is given in detail, with illustrative case histories and physical measurements of dosage. The causes of failure are discussed, and the five-year results of the author's cases are set out together with statistics from other cancer centres. Operative details are not as a rule given, but the author lays stress on such points as he has found of importance, such as the removal of the posterior belly of the digastric in a block dissection of the neck. In this connexion, incidentally, he brings the weight of his experience against the so-called prophylactic irradiation of the neck, the value of which is questioned by many radiotherapists.

The value of a book written by one man over that compiled by many specialists is particularly well seen in the chapter on the breast: having, as Mr. Cade says, confused his own mind by the voluminous literature, he comes to clear and fundamental conclusions from the study of his own cases, and the indications for the various methods of treatment are set out with such logic as must command general acceptance. There are naturally many examples in radiotherapy where opinions will differ, and not everyone will support the author's preference for the interstitial treatment of rodent ulcer to surface application; but the case is always fairly presented, and adequate references are given so that the reader may judge for himself. The chapter on cancer of the lung is written by C. Price Thomas, and those on the oesophagus, stomach, and rectum by E. Stanley Lee; these sites are the Cinderellas of radiotherapy, but the reasons for failure and the lines along which advance may be possible are adequately discussed.

With over 600 illustrations, most of them original and many in colour, and a liberal use of charts and tables, the book is an outstanding contribution to radium therapy and a worthy tribute to the Westminster and Mount Vernon Hospital Centres. It summarizes the work of the past twenty years, and will, it is to be hoped, influence the treatment of cancer for another twenty years to come.

MOSQUITO CONTROL

Mosquito Control: Practical Methods for Abatement of Disease Vectors and Pests. By William Brodbeck Herms, Sc.D., and Harold Farnsworth Gray, Gr.P.H. (Pp. 317. $3.50, or 20s. net.) New York: The Commonwealth Fund; London: Oxford University Press. 1940.

In this handsome and attractive volume, illustrated with some excellent photographs and containing useful up-to-date bibliographies to each section, the authors deal very thoroughly with the subject of mosquito control. In reviewing such a work it is perhaps as well to note that there are two distinct aspects or settings to which the term "mosquito control" applies. Mosquito control may form part of operations directed against malaria. There is also, however, the important subject of mosquito control directed against mosquitos themselves as a serious sanitary or even economic problem. This latter form of operation has been greatly developed in America, and in regard more especially to the vast numbers of mosquitos that breed in the salt swamps characteristic of some parts of the coast. Here abatement of the mosquito nuisance is so essential to the carrying on of the normal economic life of the community that it has led to operations on a very large scale, involving great expense and demanding special engineering and administrative experience. Though not entirely restricted to the latter type of operation the volume under review is primarily so concerned. Thus it is possible that the worker on anti-malaria operations, if not warned, might feel some disappointment in that in the many details now developed in the technique relating to anti-malarial measures in tropical countries he scarcely finds what he might feel to be adequate treatment. Nevertheless the book is so thorough in dealing with certain subjects—for example, the principle underlying questions of oils and larvicides, the value of different mosquito ordinances in their actual practical outcome, and many other matters—that even to the worker in the field of malaria control it should be of great value.

On the whole one gathers a most striking impression of the mechanization which has been developed in this setting—the use of the centrifugal pump and mechanical excavators, the dusting of Paris green by aeroplane and by power-operated blower, the power spraying of oil, the motor-cycle oiler and tractor-drawn tracklayer-type oiling

equipment, and other applications of modern developments to facilitate operations. Even if these mechanical applications do not seem to be always very suitable for much of the work which the malariologist has to cope with in the Tropics, such a book as the present one is a stimulus to progress and a reminder to what extent in the modern world mechanization is everywhere coming into the picture.

METHODS OF THERAPY

The Therapeutics of Internal Diseases. Volume I: *General Therapeutics, General Therapeutic Technic.* Volume II: *Drugs, Toxicology, Infectious Diseases.* Edited by George Blumer. (Volume I, pp. 872; Volume II, pp. 1,042. Complete in four volumes, cloth, £9 the set.) New York and London: D. Appleton-Century Company.

The first two volumes of this work, edited by Dr. G. Blumer, contain articles by about sixty contributors, the majority of whom are university teachers either of clinical or of laboratory subjects. As regards the general arrangement the text is based upon the description of methods of therapy. About half the first volume is occupied with physical methods, and most of the remainder with endocrine, serum, vaccine, and bacteriophage therapy. The first half of the second volume contains two long articles on pharmacology and toxicology by Prof. Louis Goldman, and the rest of that volume deals with the therapy of infectious diseases. The volumes provide a very useful work of reference regarding modern therapeutic methods. Indeed, the two articles by Prof. Goldman constitute medium-length textbooks.

The compilation of a satisfactory textbook of therapeutics is notoriously a matter of difficulty, since it is necessary to base the general arrangement either on the treatment of patients or on the forms of treatment available for diseases. The latter method has here been adopted, and modern procedures are described very fully, but as a result the work provides no systematic account of the treatment of many common conditions, such, for example, as chronic heart disease and chronic nephritis. This is reflected in the index, which contains one and a half columns under "digitalis," but a mere dozen or so references under "cardiac." Similarly, there are but three references concerning cough, and the only systematic account of its alleviation comprises two pages in the section on chronic pulmonary tuberculosis. These examples indicate the limitations imposed by the arrangement adopted. These limitations certainly must reduce the value of the volumes so far as the general practitioner is concerned. The large number of contributors necessarily involves some lack of balance as regards the amount of space devoted to different subjects. Every subject, however, is treated by a specialist; hence the information provided is of a high standard of accuracy.

The attention given to methods of physical therapy deserves special notice because these are new and of increasing importance; it is not easy to find systematic accounts of their value as full as those provided in these volumes.

THE FOOT AND ANKLE

The Foot and Ankle: Their Injuries, Diseases, Deformities and Disabilities. By Philip Lewin, M.D., F.A.C.S. (Pp. 620; 303 illustrations. 42s. net.) London: Henry Kimpton. 1940.

Already this year two new books devoted exclusively to the foot and published in the United States have been reviewed in these columns; now comes a third, written by Dr. Philip Lewin of Chicago, with the title *The Foot and Ankle.* It is rather larger than its forerunners, and within its 600 pages covers the whole subject very adequately. The production within a year of three books on the same subject would seem to show that the public and the profession are rapidly becoming foot-conscious, no less in the States than in this country. Dr. Dudley Morton's popular book, *Oh Doctor! My Feet!* is an even more certain indication of the interest which the American public now displays in the subject. Although there is no parallel to the latter publication in this country, it may be noted that we set the fashion in books on the foot with those by Ellis and by Walsham and Kent Hughes (now, unfortunately, both out of print) in the last century, and more recently with Lake's *The Foot.*

It is all to the good that interest, both professional and public, in the feet should be renewed, for undoubtedly a large amount of discomfort, inefficiency, and disability arises from foot troubles often in themselves comparatively insignificant.

The book now under review is a notable contribution to the subject in which every aspect is dealt with in considerable detail. The inclusion of the ankle with the foot is logical, and we note that the author very properly also includes such lesions as varicose veins and rickets of the leg. A little more attention might well have been given to the evolution of the foot, for, as previous writers have pointed out, therein lies the primary cause of many foot troubles. However, in a book which is essentially practical and already fairly bulky, it is arguable that such theoretical considerations must give way to matters of direct clinical application. Space will not allow a critical notice of each chapter, but we may take that on flat-foot as a sample. The impression gained here is that the author is somewhat vague as to the exact nature of this condition, and in consequence we find a long list of possible causes. The question "Is the failure primarily muscular or ligamentous?" remains unanswered, and so the indications for treatment are correspondingly indefinite. Such an agnostic attitude is probably justified by our lack of knowledge and agreement upon the many anatomical and physiological features involved, but we feel that the pros and cons of the subject should at least be submitted for the reader's judgment. It will appear rather unusual to the English reader to find so many pages devoted to the treatment of flat-foot by open operation, a procedure very rarely adopted here.

In general this book is an admirable exposition of the subject, well illustrated and well produced. We would end by quoting a wise sentence from the paragraph on "The Mental Attitude of the Patient": "The present success and popularity of quackery and charlatanism should impress upon physicians the importance of treating the mind and the emotions of the patient as well as his physical troubles.

Notes on Books

The treatment of squint in an effective manner might very well be taken as a measure of the grade of the civilization of a people. That was a thought which was impressed upon the mind of the writer when visiting a mid-European country a few years ago. There he saw many children with squints for which it was evident no treatment had been attempted. In this country, happily for the children, parents have learned that a girl with a squint has her prettiness spoiled and that a boy with a cross-eye will be rejected for many a good job. The treatment of squint may be grouped into three sections: (1) examination to determine the primary cause and the correction of any error of focus with glasses; (2) special exercises to revive the function of binocular vision; (3) operation in some cases. Section 3 demands much care, skill, and time to carry through the training. Orthoptics is no new line of treatment.

It was first attempted by Erasmus Darwin in 1778; it is likely that the modern development of the art would have intrigued him greatly. To the staff of the Royal Westminster Ophthalmic Hospital we are indebted for the example they have set in the organization of this work. *Practical Orthoptics in the Treatment of Squint*, by Mr. KEITH LYLE and Miss SYLVIA JACKSON, now in its second edition (H. K. Lewis and Co., Ltd., 15s. net), gives a full and valuable account of this treatment and the measure of success that has been obtained by it. This book will be of value to every ophthalmic surgeon, and is a necessary manual for every orthoptist working under the direction of the ophthalmologist.

They Wanted Adventure (Jonathan Cape, 7s. 6d. net) is an essay in fiction by KENNETH MACFARLANE, a pseudonym hiding the identity of the medical author of a most original autobiography. It is a story about two children, a brother and sister, who during a holiday on the west coast of Scotland found themselves taking a leading part in a series of surprisingly exciting events, ranging from the shipwreck of a fishing boat to the discovery of foreign spies in an uninhabited island. For those who are fond of sailing, children, or Scotland this should prove an acceptable book.

Miss EVELYN PEARCE'S *General Textbook of Nursing* (Faber and Faber, 15s. net), promptly recognized on its first appearance in 1937 as one of the best and most comprehensive guides for students and qualified nurses, continues to appear in new guise despite the present conditions. For the fourth edition, now issued, special sections on the treatment of gas casualties and emergency blood transfusion give it topical value, and there are sixty new illustrations, including one of the B.L.B. oxygen apparatus.

Preparations and Appliances

AN IMPROVED STRETCHER CLIP

Dr. J. T. CHALMERS KEDDIE writes:

Much difficulty has been experienced in satisfactorily securing stretchers in ambulances, particularly when carrying out exercises in darkness. The webbing equipment attached to the stretcher-carrying fitments as supplied in accordance with the Ministry of Health Circular 1794 has been found to require a great amount of time to thread through the patent buckles, especially under black-out conditions. A person wearing anti-gas gloves finds the task impossible. Owing to these difficulties personnel are apt to neglect securing the stretchers, and as the Ministry requires these to be greased with vaseline there has been a great tendency for a stretcher to slide on its carriage when the ambulance is in motion, with the result that patient and stretcher are apt to be ejected into the road.

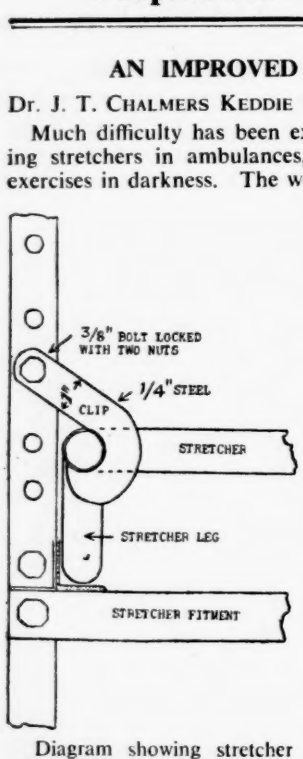

Diagram showing stretcher clip. This fits tight to the stretcher and lifts it 1/8 in. off the carriage; any weight applied on the stretcher binds it firmly to the fitment.

With the above points in mind something simple and cheap had to be designed, and the appended sketch shows a catch which serves the purpose in every way, and also provides for easy and efficient decontamination. If the catch is painted white it is easily seen in the darkness. These clips have been supplied to auxiliary ambulances in use and on "on call" and have proved most efficient.

A NEW HERNIA INSTRUMENT

Dr. HERBERT A. HAXTON (Lecturer in Anatomy, St. Andrews University) writes:

In these present days, when the operation of radical cure of indirect inguinal hernia is being performed on so many of the young men of this country, there is a place for any addition which will make the operation easier to perform and sounder in its end-result. It is with these objects in view that the instrument described below has been evolved. It consists of a body, with a head at one end and a point at the other (Fig. 1). The head is in the form of a broad retractor,

FIG. 1.

one and a half inches across and slightly curved from side to side; the blade of the retractor is curved through three-quarters of a circle. The body is four inches long and half an inch across, and it has a side-to-side curve. It tapers to a rounded point at the end remote from the head, and on this tapered part is a director groove.

This instrument has a threefold use—as a director, as a retractor, and as a depressor. The director is employed in the division of the constricting band of a strangulated hernia, the tapering part of the body protecting the viscus from damage during this manœuvre. The use of the instrument as a retractor is seen in Fig. 2, its purpose being to retract and

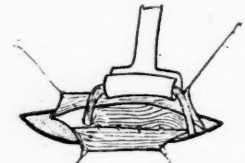

FIG. 2.

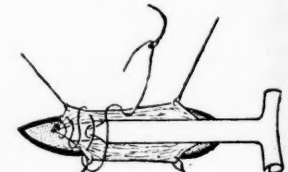

FIG. 3.

protect the spermatic cord during the procedure of suturing the internal oblique muscle and conjoint tendon to the inguinal ligament behind the cord, the essential step of Bassini's herniorrhaphy, which is the operation usually performed for the indirect hernia of the young adult. Since the blade is equal in transverse measurement to the length of the inguinal canal a full retraction of the spermatic cord is possible, so that the suturing can proceed unhampered by its presence. Other devices have been used for this step, such as a strip of gauze or a retracting ring; but these do not give the same complete retraction of the cord, combined with its protection during the introduction of the sutures.

The next step in the operation—the suture of the external oblique aponeurosis superficial to the spermatic cord—is aided by the use of the body of the instrument as a depressor and protector for the cord, as shown in Fig. 3. The procedure is to insert the pointed end in the opening in the internal oblique through which the cord passes, so that the body lies on the superficial aspect of the cord with its concave surface in contact with the latter. (The depth to which the point can be passed into the opening can be used to determine if it is too large, or so small that the veins of the cord will be constricted.) During suture of the external oblique the instrument is maintained in this position, protecting the cord from inclusion in the suture and preventing the soft fat which it contains from insinuating itself between the apposed edges of the aponeurosis, an event which results in weakening of the scar. The instrument is withdrawn on completion of the suture line, and again it acts as a guide for size, this time of the superficial inguinal ring.

The instrument has been made for me by Messrs. Allen and Hanburys, Ltd., to whom acknowledgment is due for their co-operation and for the illustration of the instrument.

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BLAST INJURIES

While we are lamenting the loss of our historic monuments it is well to take courage from the toughness of fibre of the human frame. Imagination, fed to some extent by tales spreading from theatres of recent wars, such as Spain, had endowed modern methods of war with far greater destructive power than our experience has shown them to have. Propaganda had played its subtle part in leading everyone, the medical profession included, into believing that modern high explosives had peculiar malignity. It is therefore well that the profession should have opportunity to take stock, sift evidence, and establish the truth as it sees it to-day. A discussion at the Royal Society of Medicine, reported in this week's issue, throws light on some of these beliefs, nursed early in the folds of ignorance, and disposes of much of the supposed malevolence of high explosives. Further clarification comes from the articles in our present issue by Professors Hadfield and Christie (p. 77) and Dr. Joan Ross (p. 79).

During the war of 1914–18 it was no uncommon occurrence to be exposed to and yet live through explosions at close quarters of shells of large calibre. Yet no clear clinical syndrome among soldiers subjected to such an experience emerged, and this might be thought to indicate an absence of injuries as a result of explosive forces alone. The prevailing thought was that the nervous system was particularly sensitive to this form of trauma—a thought which received the support of Mott. However, animal experimentation has established that pulmonary lesions predominate. Recently Sir Joseph Barcroft[1] undertook an investigation into the physiological effects of "blast." These experiments were so arranged that animals (goats) situated in the open and in Anderson shelters were exposed to the intense pressure changes, both of a positive and of a negative character, which are the essential elements of an explosion, following the detonation of a 500-lb. bomb. Measures were adopted to ensure the avoidance of injury by splinters. Four points were established from these experiments: first, that only animals placed in the open and at fifteen feet from the bomb suffered ill effects; secondly, that the Anderson shelters gave immunity at fifteen feet and outwards to "blast" injuries; thirdly, that the animals situated further than fifteen feet suffered no demonstrable lesion of their organs; and, fourthly, that the lesions found in the animals closest to the explosion were essentially in the lungs. Histologically[2] these lesions consisted of bruising of the surface of the lung in the line of the ribs and vertebral borders, and extended for one-quarter to half an inch into the tissue of the lung. Further small haemorrhages were found deep, mainly around the smaller bronchi. From a study of animals kept over a period of some weeks the exposure to "blast" appeared to have had no permanent ill effect. Professor Zuckerman,[3] in a more elaborate investigation designed to determine the mechanism by which the lung lesions were produced, confirmed the maximum insult to the lung tissue in a wide variety of animal species. He further obtained evidence that the lung lesions were the result of the impingement of the positive wave of pressure on the chest wall without bruising the chest wall itself. That lesions could occur elsewhere he was also able to establish, but that if these occurred the damage to the lungs was of such a massive character that the animals were dead. Of comfort to man, it was observed that such lesions were only to be found when the animal was in very close approximation to the explosive—a matter of a few feet—and this was explicable by the physical characters of the wave of pressure, which very rapidly decreased in intensity and consequently in lethal quality as it spread out radially. Two of his observations were of considerable importance in the diagnostic field—the presence of bloody sputum and the characteristic *x*-ray appearance of the chest. In view of such experimental data Professor Zuckerman, at the discussion at the Royal Society of Medicine, wisely stressed the necessity for using the greatest caution in labelling any given condition occurring in man exposed to air raids as resulting from "blast."

Four possible types of injury following a bomb explosion were propounded by Professor Zuckerman: (1) the lesions following the direct effect of "blast" and from the bomb-case splinters; (2) trauma resulting from the subject's being thrown to the ground or against a solid structure by the "blast" wave; (3) injury by secondary missiles, such as wooden beams, masonry, and such-like; (4) injury from exposure to fire or to escaping gas. Were the medical profession to keep such possible causative factors in mind and label accordingly much unwise discussion would be prevented and possibly much needless suffering, both physical and psychological, stopped. Difficulties, however, confront the medical man, for the main factor in determining the causative agent is the obtaining of a very clear history of the incident—an ideal which is not always possible to attain owing to the condition of the injured. Some evidence may be obtained from an estimation of the damage caused by the bomb; but on this aspect the profession awaits help from the appropriate authorities, who could issue, without disclosing information to the enemy, some data regarding the extent of damage from bombs of different calibre and an estimation of the zone of probable lethal "blast" injuries. This would act as a corrective to the natural tendency of all to magnify the size of the bomb and the nearness of themselves to it. With this knowledge the profession would be better armed to deal in a speedy and reliable way with air-raid injuries. There are now, however, available in the literature records of cases suffering from the effects of exposure to high explosives. Dean[4] and his colleagues observed in quite a number of cases symptoms and signs of

[1] Sectional Steel Shelters. Report upon Investigations of the Standard of Protection afforded. H.M. Stationery Office, 1939.
[2] Unpublished work of Sir Joseph Barcroft, 1939.
[3] *Lancet*, 1940, **2**, 219. See also Falla, Stephen T., *British Medical Journal*, 1940, **2**, 255.
[4] Ibid., 224.

pulmonary involvement. Bronchitic changes with fullness of the lower chest and intrapulmonary shadows shown by *x*-ray examination were common. Roberts[5] stressed the danger of giving general anaesthesia in such cases. Hadfield, at the meeting, reported on the pathological lesions found in a series of cases; these were characterized by a macroscopical and microscopical appearance closely akin to that found in the various stages of pneumonia, but more irregular in distribution. Stress was laid by him on the amount of haemorrhage in the alveoli and the marked distension and engorgement of the capillaries. He emphasized that the appearances suggested continuation of the haemorrhage over a period of some days—a point which may explain the relapses which have been noted to occur.

It is too soon to determine in full the required treatment. Adequate rest is essential; and in view of the condition of the lungs found at necropsy, and the embarrassed breathing clinically, oxygen therapy would appear to be worthy of more extensive use. Above all, the knowledge that such damage to the lungs may occur should stimulate all to be watchful for this type of damage among air-raid casualties. The Emergency Medical Service has taken the lead and has circularized its officers. The future should bring greater and more accurate knowledge, but for the public and medical profession there is comfort in the thought that such cases are necessarily uncommon and that shelters, including the Anderson, give a high degree of protection against "blast."

WARTIME MEDICINE IN THE U.S.A.

As everyone knows who follows the news which reaches us daily from America, the Federal Government of the United States is pressing on with preparations for the dual purpose of securing its own national defence and helping us and our allies to a successful conclusion of the war. In this connexion the importance of the medical and allied services is fully recognized. It may be recalled that well before the onset of war the British Medical Association had set up a Central Emergency Committee which surveyed and classified all medical practitioners in the country and recorded their offers of service, and that this committee, enlarged and known now as the Central Medical War Committee, acting through local committees, has become the Government's agent for allocating medical personnel, whether voluntarily or under compulsion, for meeting military or civilian demands. Its functions do not extend to determining whether such demands are justifiable, but it foresaw that some co-ordinating body would be needed to scrutinize the establishments of the various medical services, and made a special point of this in its early negotiations with the Government. Subsequent experience has shown the wisdom of the committee's representations. In the United States the need for such a body has been appreciated. The Selective Training and Service Act, 1940, provides for the registration of more than sixteen million men, the immediate medical examination of two to four millions, and the military training forthwith of several hundred thousand. The view in America is that each stage in this process is of medical and public health importance. A Committee on Medical Preparedness of the American Medical Association has followed our plan of carrying out a survey by questionary of the medical profession, and similar censuses are being conducted in their own field by the American Dental Association, the Nursing Council for National Defence, and the American Hospital Association. It is realized that information ought also to be compiled as to laboratory services and personnel such as that now in the possession of a committee of the Medical Research Council in this country. In some special directions a shortage of trained personnel is anticipated—for example, in caring for the health of workers in the rapidly expanding war industries. The American Medical Association has accordingly urged the Council of National Defence to provide the U.S. Public Health Service with funds for the training of physicians, chemists, engineers, and other professional workers in industrial hygiene.

In the United States, where State governments are interposed between the Federal Government and local authorities, the system has been established by the U.S. Public Health Service of holding periodical conferences in Washington of State and Territorial health officers to discuss matters of common interest. A special conference of this kind was held on September 16 and 17, to which members of the National Advisory Health Council, officials of the Army, Navy, and other branches of the Government, and representatives of professional organizations and voluntary agencies were invited.[1] Its object was to plan and co-ordinate the medical and public health measures necessary for national defence. Surgeon-General Parran emphasized the need for preserving a balance between facilities to care for the civil and industrial population on the one hand and the demands of the military services on the other. This involved special consideration of key personnel in essential health and medical services and schemes of training to ensure an uninterrupted output of professional men and women to meet both civil and military demands. But his outline of the problem and the course of the subsequent deliberations revealed that public health departments in America are thinking of problems arising from the emergency which go far beyond the mere provision and allocation of personnel. Medical examination of recruits will discover many with diseases and defects requiring treatment and the restoration of working capacity which has come to be called rehabilitation. Apart from tuberculosis, which normally falls within the province of governmental care, it appeared to be the general opinion of the conference that the State should make itself responsible for seeing that all those found with defects should receive attention. As a corollary to the recent and vigorous drive against syphilis in America, opinion was unanimous on the desirability of arranging for a voluntary blood test of every man registering, although it was realized that the practical difficulties were enormous. In the course of examination the ascertainment of tuberculosis should be specially stressed and provision made in advance for the immediate treatment of the numerous early cases which would be discovered. The health of communities where training cantonments were set up would require more than usual attention, and the

[5] *British Medical Journal*, 1940, **2**, 843.

[1] U.S. Public Health Service: *Public Health Reports*, 1940, **55**, 1760.

movement of industrial workers into new areas where munition works are to be established would create problems of health and housing of which we have had experience. The American Navy, for instance, is already faced with the housing of many new hands employed in the Navy yards. It was contemplated that all measures to deal with these problems would be a proper charge against Government funds.

Two days after this conference had met President Roosevelt approved an order creating a Health and Medical Committee. Its function is to advise the Council of National Defence on health and medical problems and to co-ordinate health and medical activities affecting national defence.[2] The new committee is to be executive as well as advisory, being vested with power to use the facilities of the medical departments of the Army, Navy, and Public Health Service, including their laboratories and equipment, and to spend moneys allocated to it on studies, investigations, and reports by such individuals or institutions as it may employ. The wide terms of its reference would appear to cover the knotty problem of priority in demands for medical personnel, although in this respect it may be subject to the overriding authority of the Council of National Defence. The committee consists of Dr. Irvin Abell, a former president of the A.M.A., as chairman, the surgeon-generals of the Army, Navy, and Public Health Service, and the chairman of the Division of Medical Sciences of the National Research Council. Its constitution, it will be observed, is entirely medical. For this reason, and because of its small size, it should be able to exercise that control over medical matters in wartime which many would be glad to see effectively established in this country.

MEDICINE IN A CHANGING WORLD

In his stimulating article on "Trends in Human Nutrition" in our current issue, Sir John Orr, in a passage under the heading of "Medicine and the New World Order," makes a statement of the widest implication to the medical man of to-day and to-morrow. "The medical profession," he writes, "contains within it experts on every subject that affects human welfare. It is the only organized group of men competent to make a statement on human needs." This is certainly a startling claim to make on behalf of any group of men within a modern State, and if it has within it the seeds of exaggeration the sower may be excused, for he brings forcibly to the front ideas that have been simmering in the minds of an increasing number of men who see the art and science of medicine, not merely as the prescribing of pills and the ameliorative use of the knife, but as a contribution to human welfare. This is not to decry the art and the craft that are the foundation of the daily work of the doctor. Knowledge and more exact knowledge is what we need. The new techniques must be increasingly used, and with a thorough understanding of their possibilities of bringing more precise information to bear on the problems of health and disease. It is perhaps a paradox that at the very moment when medicine is acquiring a technical equipment that brings it within the narrowing confines of an exact science, with the inevitable tendency to specialization, it is reaching out to a wider conception of the part it has to play in human society. This paradox is also apparent in the attitude of other workers in pure and applied science. In fact, what we are witnessing is a heightened consciousness of social responsibility in a world in which the forces of disruption are momentarily paramount.

Sir John Orr's suggestion that there are in the ranks of medicine "experts on every subject that affects human welfare" must be examined more closely. Medicine cannot concern itself with the economic man, the political man, the religious man, the legal man. Indeed, it is not competent so to do. There is even the great danger that the doctor, acting as a doctor, may be tempted to prescribe political and economic remedies for what he considers to be medical and sociological ills, and somewhat ostentatiously to ally himself with one or other political movement. Once he is immersed in the heat of political emotions his judgment as a medical man tends to become warped when he looks at medical problems through political glasses. This is perhaps well illustrated by reference to the subject of Sir John Orr's lecture. There is no doubt that the distribution of wealth in this country has made it difficult, and in some cases impossible, for a large section of the population to buy enough of the right kind of food or to live in conditions that make for the maximum possible health. The medical man has investigated in some detail the effects on such a population of malnutrition. He has been rightly concerned with the wider effects on the country as a whole. But for the medical profession, or any section of it, to bring to bear the whole weight of its authority on such a fundamental matter as diet and nutrition it must speak in terms that are strictly medical and physiological, uncontaminated with political partisanship or economic theorizing. The cobbler must stick to his last. As a private citizen the doctor may cast his vote as freely as any other man in a democracy, but we do not believe that medical men, as such, can make any worthy contribution to either medicine or politics by segregating themselves into political groups.

We would modify Sir John Orr's second proposition and restate it in some such terms as follow: "The medical profession has within its numbers those who, more than any other group of men and women, are competent to make a statement on the physiological and psychological needs of human society." We would add, too, that such a statement would be incomplete. Nevertheless it should be made, and in the period of reconstruction to which we look forward some kind of statement will be expected by a country which, in the present terrible struggle, sees justification for it in the promise of a new world—what Mr. Churchill has called "the march of the common people towards their just and true inheritance and towards the broader and fuller life." This must be based on good food, good housing, free opportunity for physical and mental development, and comprehensive medical services for the whole community. The standards for these desiderata can be laid down in a medical charter, and this could be one of medicine's greatest contributions to the new epoch of which the present war is but a sign and a portent.

[2] U.S. Public Health Service: *Public Health Reports*, 1940, **55**, 1759.

NEOARSPHENAMINE AND THE SULPHONAMIDES

In the early days of the 1914–18 war, when the science of chemotherapy was still almost synonymous with the study of the arsphenamines, certain striking results were obtained with these arsenicals in the treatment of bacterial infections. Schiemann[1] and others in Germany first showed that both arsphenamine and neoarsphenamine were bactericidal *in vitro* for the organisms of anthrax, glanders, and swine erysipelas. Later, Douglas and Colebrook[2] found that the serum of a patient to whom either arsphenamine or neoarsphenamine had been administered possessed a bactericidal action on staphylococci, while Joanny[3] among others put forward great claims for these compounds in the treatment of puerperal sepsis. Colebrook,[4] however, was less enthusiastic, although sulpharsphenamine appeared to have certain possibilities; with the advent of the sulphonamides these studies seemed, for the moment at least, forgotten. Recently, however, Osgood, Joski, and Brownlee[5] have returned to an investigation of neoarsphenamine in relation to sulphonamide compounds. By growing the cells of the human bone marrow in tissue culture it has been possible to develop a method for the accurate quantitative comparison of therapeutic agents against bacterial infections. When the bone-marrow cultures were infected with *Staph. aureus* it was found that neoarsphenamine in concentrations of 1 in 150,000 to 1 in 200,000 was more effective than either sulphanilamide, sulphapyridine, sulphathiazole, or sulphamethylthiazole. In concentrations of 1 in 10,000 sulphamethylthiazole and sulphathiazole were of considerable value but rarely led to complete sterility; sulphapyridine was only slightly effective and sulphanilamide was practically useless. Concentrations of neoarsphenamine above 1 in 150,000 were toxic to the marrow cells, and concentrations above 1 in 70,000 killed all the cells. These studies certainly suggest that administration of neoarsphenamine in intermittent courses of repeated small doses together with sulphathiazole in doses sufficient to give a blood concentration of 1 in 10,000 is worthy of controlled clinical investigation in serious cases of infection due to *Staph. aureus*. Since sulphamethylthiazole is liable to produce polyneuritis in man, sulphathiazole is the most satisfactory sulphonamide derivative for use in these tests.

SARCOIDOSIS OF BOECK

The history of the disease which still goes by this unsatisfactory name is one of unification by histological study of manifestations which clinically had appeared unrelated. To Schaumann belongs the credit of pointing out that the skin condition originally described by Boeck is only one localization of a process which may also involve many other organs, notably the lymph glands, spleen, and lungs, and there is much to be said for calling the disease by his own name, or for adopting the term "benign lymphogranulomatosis" which he suggested. Other manifestations of the same disease are the uveo-parotid syndrome of Heerfordt and bony changes in the hands and feet to which Jungling gave the name "osteitis multiplex cystica." In all these situations the histological changes produced closely simulate those of a tuberculous lesion in the proliferative stage, but caseation never follows and the ultimate fate of the lesion is usually complete resolution. The varied features of this disease were fully described in this *Journal*[6] two years ago by Bodley Scott, and it has again been fully reviewed by Leitner.[7] Now that its clinical recognition in whatever form has been made feasible, interest is centred on the problem of its aetiology. The structure of the lesion being indistinguishable from that of an early tuberculous focus, the main question is naturally whether the disease is a form of tuberculosis. Tubercle bacilli are not demonstrable in the lesions either directly or even by animal inoculation; the exceptions to this statement undoubtedly represent the coincidence of two conditions, and are no more significant than the occasional occurrence of tubercle bacilli in lymph nodes attacked by lymphadenoma. The majority of patients show no tuberculin sensitivity; indeed, they are said to be more often Mantoux-negative than unaffected persons of the same age. This anomalous finding led Jadassohn to postulate a condition of "positive anergy" in this disease, a term implying that in spite of or in consequence of actual tuberculous infection tuberculin sensitiveness has been abolished or has failed to develop. It occurred to Lemming[8] that this hypothesis could be tested by inoculating cases of the disease with B.C.G., the effect of which is to produce tuberculin sensitiveness in a previously Mantoux-negative or "negatively anergic" normal individual. He accordingly gave 0.05 mg. living B.C.G. to a typical case of uveo-parotitis, and when this was without effect of any kind followed this with a dose three times larger. A local reaction followed with swelling of the regional lymph nodes, but a Mantoux test with 5 mg. of tuberculin was still negative. Not only this, but when one of the affected nodes was excised the changes in it produced by B.C.G. corresponded in certain details rather to those of benign lymphogranulomatosis than to those which usually follow B.C.G. vaccination; the tissues had in fact reacted to vaccination just as they react in the disease itself. Repeated doses of B.C.G. in another case in which mediastinal and other lymph nodes were mainly involved failed to alter the patient's negative Mantoux reaction. While other authors can only report negative findings and speculate on the question of aetiology, these are positive facts which deserve the closest attention. But if this process is indeed tuberculous, it still remains to be explained why a lesion in which no bacilli are demonstrable, in a patient who *ex hypothesi* possesses a considerable degree of immunity, should not only persist for years but continue to develop in fresh situations.

EFFECTS OF PRESSURE ON TISSUES

A man of 185 lb. weight exerts a pressure on the soles of his feet in excess of that needed to support a column of mercury 500 mm. high. Healthy tissues are thus designed to withstand considerable pressures, the degree varying with the different body structures. Abnormal pressures, either internal or external, may lead to important tissue changes—for example, the atrophic changes which take place round a rapidly growing tumour, and the tissue destruction associated with bed-sores. Pressure is also an almost invariable accompaniment of many forms of surgical treatment; every suture and every ligature subjects living tissues to abnormal pressures, and gross pathological changes result from pressure in the case of plaster sores and Volkmann's ischaemic contracture. It has also been shown that free skin transplants are better able to withstand the effects of pressure than are pedicle grafts. John Hunter was one of the first to recognize the pathological effects caused by pressure, and came to the conclusion that internal pressure produced

[1] *Z. ImmunForsch.*, 1915, **24**, 167.
[2] *Lancet*, 1916, **1**, 181.
[3] *Thèse Paris*, 1923.
[4] Med. Res. Counc. Spec. Rep. Series, No. 119, London, H.M. Stationery Office.
[5] *Surg. Gynec. Obstet.*, 1940, **71**, 445.
[6] *British Medical Journal*, 1938, **2**, 777.
[7] *Schweiz. med. Wschr.*, 1940, **70**, 411, 441, 461.
[8] *Acta med. scand.*, 1940, **103**, 400.

atrophy and that external pressure produced hypertrophy. It was Paget who pointed out that this was one of the rare instances where Hunter was wrong, and showed that constant pressure leads to atrophic changes and inconstant pressure to hypertrophic changes. He also pointed out that it just happens that intermittent pressures are usually from without, while constant pressures are usually from within. Recently Brooks and Duncan[1] have carried out a series of experiments on the rat's tail to determine the influence of known amounts of pressure applied for measured periods on the various specific tissues. It was found that a pressure of 130 mm. of mercury for eighteen hours (approximately equal to the blood pressure in the rat's tail) was necessary before necrosis developed. One series of animals were then subjected to pressures adequate to produce massive necrosis; the arteries were subsequently injected and found to be patent. Very high pressures caused pathological changes in much shorter times. The tissue changes observed by these workers in a number of experiments included epithelial hyperplasia, scaling, muscle degeneration, replacement fibrosis, and varying degrees of necrosis. There was very little difference in the time required to produce sclerosing myositis and that required to produce massive necrosis. These experiments have a bearing on the question of pathological changes caused by abnormal pressure associated with bedsores, constricting bandages, plasters, tourniquets, and sutures, and may throw light on many of the problems relating to the effects of pressure on tissues. Meanwhile, they are being continued in animals suffering from dietary insufficiency, hyperglycaemia, and alterations in blood pressure.

TREATMENT OF VAGINAL THRUSH

The frequency of thrush as a cause of leucorrhoea is not apparently generally recognized. Liston and Cruickshank[2] found that it accounted for nearly 25% of cases in a series of 200 pregnant women. It appears necessary, therefore, to look for this fungus (*Oïdium albicans*) in all cases of leucorrhoea, and to seek for the hyphal filaments in films made from the white patches which are characteristic of the disease or from vaginal washings. The infection is much commoner in pregnant than in non-pregnant women, and frequently clears up during the puerperium; non-pregnant women often get relief during menstruation. The presence of glucose is favourable to the growth of the parasite, and diabetes mellitus is a predisposing cause, which should always be excluded in non-pregnant cases. While the infection is usually confined to the vagina and surrounding skin, it may affect the cervix and even the uterus and tubes. This should be borne in mind in those cases which either prove resistant to treatment or show a tendency to relapse. Should the infection have passed beyond the cervical canal the patient should be referred to a gynaecologist. In all cases of vaginal thrush it is first necessary to look for and to deal with any contributory factors such as cervical erosion, cervicitis, and tears of the cervix uteri, and then to remember that the infection may affect the surrounding skin, not only of the vulva but also of the pubic region, groins, and upper part of the thighs, causing intense irritation. Various remedies have been recommended. Matters[3] swabs the vaginal walls with hydrogen peroxide or dilute liquor potassae, and after drying them insufflates the vagina with powdered silver picrate in kaolin; alternatively, Bonney's blue may be employed as a paint. Mary Michael-Shaw douches with sodium bicarbonate—one drachm to the pint—and follows this with a tablet of stovarsol nightly for two weeks and then less frequently for four to six weeks or even longer. Negatol as used for trichomonas infestation—a douche of 2½% followed by painting with 100%—and "monsol" 1/200 have given good results. Strong negatol causes the mucous membrane of the vagina to become covered with a thick white film, which after a time is shed gradually or may separate as a complete cast, leaving a healthy epithelial surface underneath. Probably the most efficient remedy and the one that gives the greatest relief to the patient is gentian violet. This is used as an aqueous solution in a strength of 1% to 2% and should be painted on the affected parts twice weekly, special care being taken to include all vaginal folds and especially the posterior fornix. The treatment of vaginal thrush should not be stopped when the signs and symptoms subside, because of the tendency to relapse. The patient should be warned that cessation of symptoms must not be taken as evidence of cure.

[1] *Arch. Surg.*, 1940, **40**, 696.
[2] *J. Obstet. Gynaec. Brit. Emp.*, 1940, **47**, 109.
[3] *Med. J. Austral.*, 1940, **1**, 693.

EMPLOYMENT OF OVERSEA DOCTORS

In view of the increasing demands on the services of doctors for war purposes, two Orders have been made, under the powers of the Defence Regulations, authorizing the General Medical Council to include oversea doctors temporarily in the *Medical Register* under certain conditions. The first Order applies to doctors qualified to practise in Canada or the United States of America. They must be of British nationality or United States citizens. There is no specific condition as to employment, but the object of the Order is to facilitate their employment in the Emergency Medical Service. The second Order applies to doctors qualified to practise in any part of the British Empire or in the countries of our European Allies, or in Germany or Italy. One of the conditions of registration is that the doctor must be selected either for a medical commission in one of the fighting Forces or for employment in a hospital, institution, or service, not involving attendance in the patient's own home, approved by the Minister of Health (or in Scotland or Northern Ireland the appropriate Secretary of State). The main objects of this Order are (1) to facilitate the employment of medical officers in the allied Forces in the United Kingdom by giving them the privileges of registered medical practitioners, and (2) to facilitate the employment of Dominion and foreign doctors in civil hospitals by giving them the same privileges. The Orders do not affect the operation of the Aliens Acts and Orders. The Central Medical War Committees for England and Wales and for Scotland are compiling a list of doctors likely to be available for civilian employment and qualified for registration under the Orders. Any of these doctors may make a provisional application to the General Medical Council for registration, in order to avoid delay in the final registration when he is selected for employment. Mr. Malcolm MacDonald, the Minister of Health, is sending a circular to local authorities and other hospital-owning bodies drawing their attention to the Orders and advising them to take advantage of the new arrangements for filling vacancies for which British doctors are not available or in order to free British doctors for war service. A similar circular is being issued by the Secretary of State for Scotland.

We print on page 94 of this issue a brief statement on the Nuffield Provincial Hospitals Trust, and an important letter sent by the Minister of Health, Mr. Malcolm MacDonald, to Mr. W. M. Goodenough, the chairman of the Trust.

NUFFIELD PROVINCIAL HOSPITALS TRUST

This Trust was founded by Lord Nuffield in December, 1939, with the object of promoting a proper co-ordination of hospital services throughout the provinces in England, Scotland, and Northern Ireland, by means of full co-operation between the voluntary hospitals and public health authorities, in close consultation with the Minister of Health and the Secretary of State for Scotland. It was hoped that arrangements to this end would be agreed upon a regional basis connected with appropriate hospital and medical teaching centres. It was understood that close contact would be maintained between the Trust and King Edward's Hospital Fund for London.

At the end of twelve months the Chairman of the Trustees has reported to the Minister of Health. The Central Regionalization Council of the Trust has been formed, on which the Provisional Central Council of the British Hospitals Association is represented. A medical advisory council has also been established under the chairmanship of Sir Farquhar Buzzard. An advisory committee of the Trust has been established in Scotland under Mr. Tom Johnston as chairman, with a medical advisory committee under Sir John Fraser.

Discussions on arrangements for regionalization of hospital services have taken place in many important provincial centres with representatives of the public health authorities and of voluntary hospitals. In some of these centres plans for the formation of regional councils are already completed or are well advanced, and it is hoped to set them in motion in many others at an early date. The Trustees expect to be able to consider the question of financial grants to regional councils from the income of the Trust very shortly.

Having been informed of the progress made, the Minister of Health has addressed the following letter to the chairman of the Trustees:

Ministry of Health,
Whitehall, S.W.1,
January 6, 1941.

Dear Goodenough,

I have been keenly interested in my various discussions with you and your colleagues of the Nuffield Provincial Hospitals Trust to learn details of the Trust's present and prospective work, and should like to assure you of my warm sympathy and continuing support in the valuable work that you are doing. The question of post-war hospital policy is one of major importance, and I am sure that the Trust is right in attempting, even during the heat and labour of the present struggle, to focus discussion by bringing together in its regional councils representatives of the various interests concerned with a view to clearing the ground for future action. I can assure you that in the Ministry of Health much careful preparatory thought is being given to this problem, as well as to the wider questions concerning the medical and health services of the nation.

Let me add that I think you are right in concentrating on two points. Whatever may be the proper ultimate hospital service, we should build up from existing organizations, and the first is, therefore, to find the right relation between the local authorities on the one hand and the voluntary hospitals on the other. Both have played a great part in our hospital system in the past and will, I am convinced, make essential contributions to the future. There is, as you know, a variety of ways in which under the existing law a fruitful co-operation between local authorities and voluntary hospitals can be achieved, and I do not doubt that further methods of mutual assistance and co-operation can and should be devised.

Secondly, I am convinced that the problem is one that must be examined on a basis wider than that of existing local government areas and that some form of regional unit will be necessary in designing a system which will make the best use of our existing hospital accommodation and will avoid duplication and waste in making good any deficiencies. The precise manner in which a regional conception of this kind should be fitted into the existing system of local government is in itself a problem calling for most careful, constructive consideration, and I am very glad to know that the local authorities, through their representatives on your regional councils, are taking an active part in the discussions which the Trust has set on foot.

I remember Lord Nuffield telling me on one occasion that it was his early ambition to be a doctor. I am exceedingly glad that he did not realize his ambition. It is not that patients would not have benefited greatly by his skilful attention, but that by turning his great abilities in another direction he has incidentally been able to perform services to Medicine which are unique in their generosity and wisdom, and which place him for ever amongst the unselfish benefactors of mankind.

Yours sincerely,
(Signed) MALCOLM MACDONALD.

W. M. Goodenough, Esq.,
54, Lombard Street, E.C.3.

Reports of Societies

PROBLEMS OF BLAST INJURIES

The Sections of Surgery and of Pathology of the Royal Society of Medicine joined together for a discussion on January 8 on "Problems of Blast Injuries," Mr. J. B. HUNTER occupying the chair.

Prof. S. ZUCKERMAN, after a reference to earlier literature on the subject, described experiments carried out under the aegis of the Research and Experiments Department, Ministry of Home Security, with a view to defining first of all the scale of damage which follows upon exposure to charges of different magnitude. The experiments were carried out on animals, using explosive in paper containers in order to avoid any confusion of results due to missiles.

The effects of blast had been the subject of a good deal of misconception and misstatement. When an explosive detonated, a certain amount of solid substance was converted almost instantaneously into a very much larger volume of gas. When this took place in the metal casing of a bomb a pressure was set up, variously estimated at from 100 to 600 lb. per square inch, as a result of which the bomb casing burst and the gas by expansion imparted pressure to the surrounding atmosphere. The blast wave constituted by this expanding zone of pressure moved extremely rapidly, especially close to the bomb. The wave of increased pressure left behind it a zone of rarefaction, so that behind the advancing front of the blast there was a region of decreased atmospheric pressure. If the amount of pressure were measured according to the distance from the explosion it would be found that close to the bomb the pressure was abnormally high, but that it fell off very rapidly. Taking a large bomb, no very serious pressures from the clinical point of view would be experienced thirty or forty feet away, and at sixty or seventy feet the pressures did not really matter at all clinically, even though they might be sufficient to damage walls and windows.

Experimental Findings

The experiments, Prof. Zuckerman continued, had been carried out on mice, rats, guinea-pigs, rabbits, cats, and monkeys. Different species varied in their susceptibility to given blast pressures. As a general rule it took at least 50 lb. excess pressure per square inch to kill an animal such as a rabbit, and lesions had not been observed with pressures lower than 5 lb. per square inch. Near to the explosion the animals would be found dead within one minute, usually with blood-stained froth in the mouth and nose. Further away, in a zone of lower pressure, the animals would die, as a rule, within twenty-four hours. The clinical features were fairly constant, including air hunger and dyspnoea, but the

animals were nevertheless capable of great physical exertion. Knee-jerks were present, the pupils responded to light, the corneal reflex was in evidence, and hearing did not seem to be very much impaired. Such was the general picture of the animals exposed in the fatal, but not immediately fatal, zone. Further away was a zone in which the animals survived and recovered, and in which they showed no external appearances of injury, though post-mortem examination revealed internal changes.

The changes observed post mortem varied in intensity according to the pressures to which the animals were subjected. The lungs might show minute lesions or severe haemorrhages, which were apparent on the surface and sometimes followed the line of the ribs. In animals which had been exposed to very high pressures the lungs were found to be practically one mass of haemorrhages, with practically no normal substance left. The haemorrhages were not merely pleural; they extended right into the substance of the lung. Occasionally laceration was found, sometimes following the line of the ribs, and with lacerations pneumothorax and haemothorax occurred.

There had been numerous speculations as to how these changes were caused. The view which the experiments substantiated was that the lesions were due to the impact on the body wall of the pressure component of the blast wave. Rabbits were exposed to explosions of hydrogen and oxygen in balloons. When very close to the balloons the lesions were found to be mainly or entirely localized to the side facing the balloon. It appeared to be a direct impact effect, not some general effect through the trachea; if the latter, the lesions would be expected to be bilateral. In another set of experiments one half of the animal was covered with sponge rubber; if the covered side were placed towards the explosion the animal received practically no lesions, but if the covered side were away from the explosion it received many lesions on the side facing the explosion and a few sometimes on the covered side. Pulmonary lesions due to blast were thus at least partly comparable with those due to simple severe falls or blows—of which there were numerous examples in the literature.

No changes have been observed in the heart muscle or in the endocardium, although when sudden death occurred right-sided dilatation was found. Pericardial and epicardial haemorrhage had been observed. Out of several hundred cases all of which had lung lesions, 40% had abdominal lesions also. The intestine was specially susceptible, and haemorrhages had been observed extending around several inches of the gut; rupture of the gut had also been observed. Lesions also occurred in the liver and spleen, less frequently in the kidneys and adrenals, and sometimes in the bladder, particularly around the neck. As for the head and neck, there was bruising around the eyes and in the fascial planes of the orbital cavities. Rupture of the ear drums was observed at high pressures. In monkeys no lesions were observed in the brain itself (in the cortex, mid-brain, pons, and medulla), but in the cord haemorrhages were found around the spinal roots, especially in the thoracic region. Similar but more extensive haemorrhages had been observed in rabbits.

The Clinical Problem

The injuries whose effects he had described were caused by blast alone. A bomb, however, was not a paper container of high explosive. Part of the blast wave was taken up in shattering the bomb casing. The bomb pulled down buildings, sent secondary missiles flying, and in the process of causing these many effects the blast pressure became much decreased. The attenuated blast wave, although it might act like a heavy wind and throw a man against a hard surface, was incapable of causing direct injuries such as he had been describing. A special casualty survey, in which cases had been differentiated according to the circumstances in which each casualty occurred, had made it plain that the danger zone within which the primary effects of blast would be experienced was very limited. There was little likelihood that if one was lucky enough to escape splinter wounds from the detonation of a bomb on the surface one would be killed by the direct effects of the blast of a big bomb further than thirty feet away, and in the case of a small bomb further than, say, about ten feet. Internal lesions, especially in the lungs, which might be observed at further distances were probably not due to blast at all, but to violent falls or the impact of flying or falling masonry.

In general, very few cases of injury due to direct effects of blast had been observed. Sometimes a death had been ascribed to blast when it was in fact due to secondary or tertiary blast effects such as falling masonry. Out of about sixty casualties included in the special casualty survey, post-mortem examinations had been carried out in ten cases. In seven there was lung bruising, but in only one were the circumstances such that the bruising could be ascribed to the direct effect of blast alone. From these observations he concluded that the direct effects of blast alone were rarely the cause of death in air raids; and that when blast injuries did occur they were often mixed up with injuries caused by other agencies.

Some cases of non-fatal injuries due to blast had been seen. One such case was of a man in an anti-aircraft unit who was running to his post when an "alert" sounded; bombs fell and he found himself between three explosions, none further than about twenty-five yards. He was thrown down by the blast, picked himself up, when another bomb again threw him down. Finding himself apparently uninjured, he went to an air-raid shelter, where he started to cough up blood; as he had no external wounds he carried on with his job. Later he had to go into hospital, where he remained for sixteen days, and *x*-ray films showed shadows in the right base of the lung, which eventually cleared up.

Prof. Zuckerman concluded by again emphasizing that in the case of non-fatal injuries presumed to be due to blast *x*-ray examination, also an examination of the ear drums, and particularly examination for external injuries, should be made before a diagnosis of primary effects of blast was decided on. Some of the dead brought in after air raids who showed no external sign of injury had died of asphyxiation or of carbon monoxide poisoning. In other cases in which lung injury was found the lesions were usually due not so much to the direct impact of the blast wave as to a blow by some hard substance on the body wall. What actually caused death in such cases—in fact, what caused death in experimental animals subjected to blast alone—was not known, and it was to the solution of that problem that some experiments at the present moment were being directed.

Lung Injuries caused by Blast

Prof. GEOFFREY HADFIELD based his remarks on thirty post-mortem examinations which he and a number of colleagues whom he named had carried out. In eight of these cases there were haemorrhages into the lung without significant external injuries. In four cases there were pulmonary haemorrhages of considerable degree, associated with much saturation of the blood with carbon monoxide. In two cases there were pulmonary haemorrhages and an associated injury not considered to be fatal, such as a fractured limb. In three cases in which the patient had recent haemorrhages into the lung the lung itself showed severe chronic bronchitis and emphysema. Two patients proved to have died from compression asphyxia, and three from asphyxia due to inhalation of finely divided chalk, plaster, and brick dust. Out of the thirty patients who were considered to have died from "blast," eight showed no evidence of a pulmonary lesion. The haemorrhages were frequently deep in the lung and occasionally gave relatively little indication on the surface that they were so extensive. Naked-eye laceration of the lung was not found in the absence of damage to the thoracic wall. No very great degree of rupture of the alveolar walls was found, and very frequently there were large numbers of alveoli whose walls appeared to be quite intact.

The amount of haemorrhage into the lung in these fatal cases varied within very wide limits. He and his colleagues felt that if a patient did recover from the initial explosion bleeding still continued in the lung, so that those who survived showed very much larger areas of haemorrhage than were apparent in those who were found dead. He instanced one victim who had lived for fifty-one hours and had continued to

bleed into his lung during the whole of that time. Prof. Hadfield showed slides illustrating the general and the microscopical appearance of the lung in these cases, and pointed out the significance of the different areas. His deduction again was that bleeding might continue for at least forty-eight hours and reach a considerable degree, causing consolidation of very large areas of the lung.

After describing in detail the story of the victim who had lived for fifty-one hours after the explosion, and who developed a syndrome which could be said to have been due to generalized capillary congestion of the lesser circuit, with relief of most of his urgent symptoms by venesection, Prof. Hadfield said that, after what Prof. Zuckerman had emphasized, he did not wish to claim that the cases described were due to the pure effects of blast. Seventeen of them, however, showed extensive pulmonary bleeding without significant injury to the thoracic parietes, and one point he wished to make as a result of this post-mortem research was that the primary and essential lesion of pulmonary blast may be widespread dilatation and congestion of the alveolar capillaries. It was worth while considering whether a good deal of the intra-alveolar capillary bleeding was due to diapedesis. If the histological picture were combined with the clinical findings during life, it was rather more easy to explain the latter on the basis of generalized vasodilatation of the whole lung on both sides rather than by the bleeding itself. It seemed that the major clinical manifestations shown by these patients were due more to this enormous capillary dilatation of the lung than to actual bleeding, which might well be an expression of the vasodilatation.

Prof. Hadfield concluded by saying that he felt that his contribution to the discussion, founded as it was on human material, was rather a premature one. What he had said was founded on a very short experience, but the evidence did point to this single fact—that following exposure to detonation of a high-explosive bomb bleeding into the lung could continue for a period of days. This must, of course, have an influence on treatment, and patients should be kept immobile and treated as for haemoptysis.

General Discussion

Dr. J. N. O'REILLY said that in three cases which he had been investigating one clinical point had emerged—that within forty-eight hours in two of them and within four days in the other the cases had apparently become those of ordinary clinical lobar pneumonia. Another point was that five patients belonging to the same "incident" were brought in with the appearance of acute abdominal catastrophe—rigid abdomen, pain, and so on—and two of the cases were sufficiently serious to require surgical intervention; but nothing was found except a few minute subserous haemorrhages. Dr. J. M. ALSTON asked whether Prof. Zuckerman's work had gone far enough in the direction he had indicated to decide whether the animals which survived the shock experiments showed the lesions of pseudo-pneumonia, as Dr. Hadfield had suggested. Dr. BERYL BARSBY had seen two cases of injury unquestionably due to blast in which there was spontaneous haemothorax, with *x*-ray evidence of blast on the other side and ruptured spleen

Prof. ZUCKERMAN, in replying on the discussion, said that he had seen no evidence of haemorrhage continuing in the lungs of experimental animals as a result of exposure to blast, although lesions were often better marked in animals which survived for some time than in animals killed outright by blast. He added again that he was not convinced, without knowing in detail about the circumstances of injury, that haemorrhagic lesions in the lungs which were observed in air-raid casualties were due to blast alone. The possibility that such lesions might in some cases be due to violent falls or the impact of solid bodies should, he felt, also be borne in mind.

Two hospitals for casualties for the British Forces in the Middle East are to be established in South Africa at the request of the British Government. They will be situated near Johannesburg and Port Elizabeth.

Correspondence

Epidemic Influenza

SIR,—The letter by Dr. William Hartston on the above subject (December 21, p. 878) accuses me and my colleagues at the National Institute for Medical Research of retarding a simple understanding of the disease "influenza." As the clinical member of this team of workers until recently, I am sorry if our work has retarded a clear understanding of "influenza" by any of my fellow clinicians. However, it is my opinion that at the present time any simple understanding of the syndrome of clinical influenza is an illusion.

In any investigation of a clinical condition it is necessary to proceed from the known to the unknown. Thus in 1937 the ferret-pathogenic virus now termed "influenza virus A" (*Lancet*, 1940, **2**, 413) had been recovered in various parts of the world only from outbreaks of respiratory disease occurring during widespread epidemics of influenza in the community. It had not been recovered from sporadic cases of influenza, nor from several localized outbreaks of respiratory disease occurring in schools and Service institutions. At that time clinical and epidemiological differences were detected between the latter outbreaks (then termed "febrile catarrhs") and the one widespread epidemic of virus A influenza which had been studied (Medical Research Council Special Report, No. 228, 1938). Wilson Smith, Andrewes, and I therefore chose to refer to the ferret-pathogenic virus as "epidemic influenza virus" to avoid confusion with these other diseases of unknown aetiology. The care with which this term was used by us on all possible occasions was apparently lost on Dr. Hartston, who now pleads that we had failed to recognize the existence of an *endemic* clinical influenza not due to any known virus!

In 1939 there occurred in Great Britain an epidemic of influenza which differed from that of 1937 in having a lower incidence of pneumonia (*Lancet*, 1940, **1**, 205). During this epidemic the ferret-pathogenic influenza virus A was not absent, as Dr. Hartston states, but evidence of its presence as an infecting agent was found in approximately 30% of cases only. At the bedside I found it impossible to distinguish cases which would yield influenza virus A from those where the virus was not demonstrable. The investigations of Dr. Wilson Smith and Dr. Andrewes upon the cases of clinical influenza which were virus-negative on ferret test led them to suspect that another virus unrelated to influenza virus A was responsible for the clinical condition. All attempts to demonstrate this hypothetical virus, however, were fruitless. The investigation of future outbreaks will doubtless decide whether epidemics of influenza are at times aetiologically diverse, as was suspected in 1939.

Meanwhile, Francis in New York (*Science*, 1940, November 1) has succeeded in recovering a virus weakly pathogenic for the ferret but serologically quite distinct from influenza virus A from patients during an outbreak of influenza in 1940. This virus has been christened by him "influenza virus B," and its existence reveals clearly the aetiological diversity of the clinical condition "influenza." It is probable that we are only upon the threshold of knowledge concerning the pathology of epidemics of influenza. In the present circumstances it seems to me unreasonable to demand a clarification of the term "influenza." We must await further knowledge, and I would plead for patience on the part of those clinicians who find the ways of research workers laborious and even confusing.

In conclusion, I do not propose to criticize Dr. Hartston's suggestion for forecasting influenza pandemics, because we have as yet no certain knowledge of the causation of pandemic influenza.—I am, etc.,

C. H. STUART-HARRIS,
Major, R.A.M.C.

Jan. 4.

Medical Planning Commission

SIR,—I wish to congratulate the Executive Committee and the Council on the personnel of the Medical Planning Commission. I am not quite clear as to the powers and functions

of the body, and being jealous of the rights of ordinary members and democratic ruling of the Association I am anxious to be told what these are.

The terms of reference are quoted as being: "To study wartime developments and their effects on the country's medical services, both present and future." Did the Council of the Association find this too big a job? In my opinion it should not have been had the Representative Body and the Branches elected their members with sufficient care. However, the Council has, without any reference to the Divisions and Branches, appointed the Commission, and since we as a Representative Body gave these powers to the Council we can have no grounds for criticism.

Will the Commission report direct to Council? Will the Divisions and Branches have a chance to study and if necessary criticize its findings? I understand that the real work will be done in committees set up by the Commission itself. In what way will the duties of these committees differ from those of the committees elected by the Representative Body in Aberdeen in 1939? Is there any new aspect of medicine which does not come within the purview of those committees?

Your leading article (January 4, p. 19) says, "War has thrown up into sharp relief the deficiencies of our peacetime system of administering relief to the sick and of promoting and maintaining the health of the people." If the report of this Commission is endorsed by the members as a whole, will it not prove that the war has also shown that within the Association our present system of self-government and election is also deficient, since it was found that such an important work was beyond those we elected?

The task which is set for the Commission is great and necessary. It is obvious to many of us that a change will be necessary after this war is over, but this is not a result of the war; it has been on the medico-political horizon for many years; the war has made some people see it more clearly. Mr. Walker's admirable speech at Aberdeen in July, 1939, though not covering the whole ground, made many of us who talked on this subject outside the meeting realize that we all agreed on at least one principle—namely, that a change, and a radical change, was necessary.

It would be most desirable that, when the Commission's report is presented, before adopting it or any part of it the Council should send it to the Branches and Divisions and also find a way for the Service members to discuss it, for they will be concerned very materially when they return to civilian practice. The correspondence columns, which are at the moment practically the only medium of discussion, are not adequate for the purpose of discussion on a problem of such magnitude.—I am, etc.,

Yardley, Jan. 7. ARTHUR BEAUCHAMP.

*** The Secretary of the British Medical Association states that Dr. Beauchamp may rest assured that the Commission will report direct to the Council of the Association, and that Divisions and Division Branches will have a chance to study and, if necessary, to criticize the findings of the Commission.

SIR,—The problems that will face England at the end of the war will be many and great. It is possible, I suppose, to return to the pre-war medical position, but even if this is possible it should be refused, for the only chance of a better medical service will be to cut away completely from the old order.

Already before the war the B.M.A. had foreseen coming trouble and had tried to put its house in order, but unfortunately the changes suggested were not radical enough. Now the Commission faces an enormous task—a task with which no preconceived ideas should be allowed to interfere. The background to all these difficulties is, first, the impoverished state of our country, and, secondly, the unsatisfactory nature of pre-war medical practice.

The problems with which I wish to deal in this letter are two. First there is the problem of the return of evacuated medical men to their areas before the return of the population, and the consequent financial suffering of all; surely the Government should be pressed at an early date to allow of only gradual return and to make financial arrangements to tide over this difficult period. Secondly there is the problem of voluntary hospitals in evacuated districts at the end of the war: the impoverishment of the much smaller population will make it difficult, if not impossible, to raise sufficient funds to maintain these hospitals, and it seems to me that only State aid can possibly save our hospitals.

I am convinced that the future of medical practice in England will be a full-time State medical service with a pension at 60. Two difficulties will have to be faced. The first is the prevention of lack of initiative due to the sense of security afforded by the Civil Service, and this danger will be even more prevalent in the medical service. The remedy is to have promotion, to a considerable extent, dependent on the success of the practitioner. The second will only exist at the beginning of the service, and is caused by the fact that the purchase price of the practice is, often enough, the only capital the general practitioner can save for his children. This capital should be repaid, and in the case of the medical men of 60 or over who are compelled to retire on a pension their capital could be repaid by capitalizing part of their pensions.

These are but some of the ways by which we hope to obtain a medical service satisfactory both to the nation and to the medical profession. The Commission must achieve success, for if this self-appointed Commission fails, never again will the medical profession have a chance of setting its house in order. —I am, etc.,

Felixstowe, Jan. 6. P. L. GIUSEPPI.

Transplacental Tuberculosis and Transplacental Melanomatosis

SIR,—Dr. Monica Davin-Power's case (January 4, p. 13) appears, as she claims, to be a genuine example of transplacental tuberculous infection, although the placenta was not examined, and one may remember that Schmorl declared that as many as 20,000 sections might have to be gone through under the microscope before tuberculous lesions, even when really present, could be found in a placenta.

The study of the very rare published cases of proved transplacental tuberculous infection[1] throws light on the possible transplacental infection of the foetus in other microbic diseases. To my mind it also suggests that in extremely rare cases a woman suffering from disseminated metastases of some malignant neoplasm might become pregnant. If so, one or more metastases might occur in the placenta, and might "grow through" the placenta into the foetal circulation, tumour cells thus passing via the umbilical vein to the foetal liver. The child might then be born apparently free from disease. After seven months or so, on examination its liver might be found irregularly enlarged, and later on it might begin to lose weight, and, with increasing cachexia, die nine or ten months after birth, with multiple malignant neoplasms, mostly in the liver. Nevertheless, I know of only one recorded case in which this really was proved to have happened. The case in question was one of malignant melanomatosis, which I published conjointly with my colleagues Dr. E. Schwarz and Dr. R. Hellenschmied in the *Lancet* in 1930 (**1**, 537). The infant's mother had died three months after childbirth with visceral and subcutaneous metastatic melanomata. Mr. Eardley Holland was fortunately able to assure us that the placenta was huge and black, and proved on examination to be infiltrated with masses of melanotic growth. The child's liver, now in the museum of the Royal College of Surgeons of England, was demonstrated by us on February 28, 1930, at the Royal Society of Medicine. The nature and whole course of the neoplastic disease in mother and child were proved to the hilt.—I am, etc.,

London, W.1, Jan. 6. F. PARKES WEBER.

Sunlight Treatment

SIR,—One is somewhat surprised to see that the letter published under this title in your issue of December 21 (p. 883) is signed by Dr. Albert Eidinow. As a whole it conveys the impression of decrying actinotherapy in general and the mercury vapour lamp in particular—an impression which I am sure Dr. Eidinow did not intend to convey, and which no user of actinotherapy would wish to leave on record unexpunged.

[1] Weber, F. P., "Congenital Tuberculosis—A Survey," *Brit. J. Child. Dis.*, 1916, **13**, 321, 359.

On one point of fact Dr. Eidinow appears to be gravely misled in his statement: "Unfortunately the therapeutic value of the rays of the mercury spectrum is derived from the ultra-violet rays of short wave-lengths—from 2,970 Ä.U. to 2,500 Ä.U. These rays are completely absent in sunlight as received at the sea level." This statement correctly describes a low-pressure mercury discharge tube on Geissler principles (what our American friends term a "cold quartz lamp"), but is quite at variance with recent determinations of the output from a high-pressure mercury arc as commonly used by electro-therapists in this country. The radiation from such a source—that is, from the arc itself (disregarding heated metal reflectors)—is distributed as follows:

A. Non-solar erythema-producing ultra-violet from 1,850 to 2,800 Ä.U.	18.5%
B. "Dorno" rays—that is, erythema-producing ultra-violet, 2,800 to 3,200 Ä.U., corresponding to mountain sunshine	20.3%
C. Inactive (solar) ultra-violet, from 3,200 to 4,000 Ä.U.	15.9%
D. "Visible" radiation	35.0%
E. Infra-red	10.3%

Among these groups the "Dorno" rays are much the most important in all those therapeutic actions which are associated with the production of erythema; the radiation shorter than 2,800 Ä.U. has much less erythema-producing power, and is largely absorbed in the outermost layers of the skin. It is perhaps worth expanding this point, since it was once not uncommon for writers to speak in terms of "short-ray technique." As Dr. Eidinow well says: "No simple lamp has as yet been designed which emits rays of light containing similar intensity and wave-length to the sun or sunshine." Indeed, physicists tell us it is technically impossible for any lamp to emit radiation similar to sunshine, since no substance on earth can be made to burn at the solar temperature. Yet it would be totally erroneous to ascribe the therapeutic value of the mercury arc solely to rays which are outside the solar spectrum.

Sixteen years ago I stated my opinion that accurate prescribing in actinotherapy was only possible with artificial sources, and provided that an ultra-violet lamp gives the required results, as the mercury vapour arc abundantly does, one is not disposed to care whether it resembles sunlight closely or otherwise. That the short (non-solar) wave-lengths have some value is, however, substantiated by too many clinical observations to be doubted to-day. One of the most recent and interesting tests in this connexion was made by Kovacs (1937), who irradiated two groups of patients suffering from secondary anaemia with (*a*) the complete quartz mercury vapour spectrum, and (*b*) equal amounts of radiation from the mercury arc so filtered that the shorter rays were eliminated. In both groups the production of haemoglobin was increased, but the rate of increase was found to be greater when the complete spectrum was used. Widely different from sunshine in a spectral sense, the mercury vapour lamp is clinically valuable because of its emphasis on the important "Dorno" rays, so deficient in our climate. If its additional (non-solar) radiation adds to its therapeutic value we clinicians may accept that and be grateful.

On the subject of technique Dr. Eidinow's letter leaves the impression that the only dose which is valuable for increasing immunity and resistance is the minimal erythema dose administered on a limited skin area. While I have gratefully quoted Dr. Eidinow's conclusions on this restricted-area dosage in several editions of my book, I equally emphasized—and do so to-day on much greater evidence—the value of exposing the whole body to ultra-violet radiation in minimal or sub-minimal erythema doses. This technique of restricted skin-area doses for tonic effect—as distinct from counter-irritant local actinotherapy, which is a different matter—was originated by Dr. Eidinow fifteen years ago, based upon his experiments on rabbits. He has proclaimed it consistently ever since, and so it has doubtless been extensively tried; yet despite the very widespread use of actinotherapy to-day in public health work, in the Services, and in private practice, the method of general irradiation for tonic effects continues to be the method of choice. Dr. Eidinow has therefore fallen into a very grave *ipse dixit* in his closing remark: "Beneficial results will only be obtained when dosage is accurately controlled by a technique similar to that which I have described as 'short-wave therapy.'" Nobody could support either the terminology or the assertions of this sentence. The term "short-wave therapy" is, of course, now definitely kept for a different form of electro-medical treatment. The beneficial results follow consistently after quite other techniques, not only in the treatment of disease but in what I have described elsewhere as the treatment of health—that is, the use of artificial sunlight for the keeping of health and the prevention of disease. I followed with very close interest the first practical and very successful experiments in this connexion at a colliery and a theatre respectively many years ago, and so can see nothing but good in the very widespread use of tonic artificial sunbaths to-day. As a means of maintaining health among overworked munition makers, overtaxed members of the fighting Forces, under-rested shelter sleepers, and so forth, I can conceive of no other single measure which could be so beneficial.—I am, etc.,

F. HOWARD HUMPHRIS.

Watermouth Castle, N. Devon, Jan. 2.

Haemorrhagic States with Snake Venom and Lecithin

SIR,—It was with particular interest that I read the article by Prof. L. J. Witts and Miss Felicity C. G. Hobson (December 21, p. 862), since I published recently a paper[1] showing that Russell-viper venom may with advantage be substituted for tissue extract in Quick's method of prothrombin estimation.

I find it difficult to understand the authors' contention that "if venom is used instead of brain extract to measure prothrombin in the Quick test it must be fortified by the addition of lecithin." Their figures do not support this statement, since the values they obtained using Quick's test lie closer to those obtained by the use of venom alone than to those given for venom plus lecithin. This can be clearly seen by plotting their results with Quick's test in Fig. 1.

But an essential condition of Quick's test for prothrombin is that an *optimal* amount of thromboplastin must be added to the plasma. The authors added to 0.1 c.cm. of plasma 0.1 c.cm. of Russell-viper venom in a dilution of 1 in 50,000, whereas I have shown that the optimal dilution of venom in this test is approximately 1 in 10,000. If more dilute venom is used longer clotting times are obtained. The failure of the authors to use an optimal concentration of venom makes it impossible to assess their results with any accuracy. Moreover, they state that in disease of the liver the clotting times with Quick's reagent and venom plus lecithin run parallel. Actually a comparison was made in only one case apart from the patient with "treated jaundice." Lecithin undoubtedly seems to have a potentiating effect on the coagulant action of Russell-viper venom, but the authors have not proved that its use in a test for prothrombin deficiency is desirable.—I am, etc.,

Aberdeen, Jan. 8. HAROLD W. FULLERTON.

Oxygen Therapy

SIR,—It is well on forty years since Pembrey and Beddard first mooted the use of oxygen as a therapeutic measure. To the public its use is associated with impending dissolution, a frantic call for oxygen in a dying relative, the incessant bubbling bottle at the bed of the pneumonic patient, and the inevitable final words of the bulletin presaging the death of some notable personage: "Oxygen is being administered." Even the doctor himself, pardonably a little baffled by the complexity of some of the physiological principles involved, seems reluctant to use it except in some of the final stages of respiratory embarrassment.

Within the last few years, especially with the simplification and perfection of the mask, oxygen therapy has become a measure not only for the heaving struggling chest but also for the living, struggling cell far from this scene. Its great value in shock is accepted, but its hesitant use still indicates that it is reluctantly appreciated. In such conditions as abdominal distension and thyrotoxicosis and post-operatively as a routine following gastric operations it has proved itself. It is by its local effects that it now gives promise to play its greatest

[1] *Lancet*, 1940, **2**, 195.

role. We know of it as a valuable weapon in peripheral vascular disease. We know that in any injury—whether it be burns, the bomb splinter, the surgeon's knife, the trauma of the stitch—there must be a number of cells whose survival depends on whether they encounter circumstances most favourable to repair. Any bruised tissue suffers from oxygen lack, and the importance of this is enhanced by the fact that trauma in the neighbourhood of a vessel results in spasm, which limits further the blood supply. The maximum amount of oxygen that can be carried in that now trickling stream is, therefore, of prime importance. By the inhalation of pure oxygen it is known that the oxygen in solution in the plasma, which is normally 0.3 c.cm. per 100 c.cm. of blood, is raised to 2.2 c.cm. The oxygen in combination with haemoglobin is simultaneously raised from 19.2 c.cm. to 20 c.cm. There is thus produced a total increase of arterial oxygen from 19.5 c.cm. to 22.2 c.cm. per 100 c.cm. of blood, an increase of nearly 15%. Of even greater importance than the percentage increase in the amount of oxygen is the rise in its partial pressure in the blood, for it is this that determines its availability to the tissues. In fact, Boothby has shown that in the shocked patient with his low venous oxygen the partial pressure of oxygen in the capillaries may be raised from 14 to 21 mm. Hg —a rise of 50%—by the inhalation of pure oxygen alone.

It is all too common for cyanosis to be regarded as the prime indication for oxygen therapy. In fact, cyanosis does not occur until there is at least 5 grammes of reduced haemoglobin in 100 c.cm. of blood. It follows, therefore, that in haemorrhage, shock, and anaemic states oxygen want may be present long before there is sufficient reduced haemoglobin to give a visible external indication as cyanosis. This established fact, which is of the utmost importance, has not in the past been sufficiently stressed.

Despite reassurance the patient, as he dons the mask, feels that he "must be bad." He is apprehensive, afraid to go to sleep, and is often anxiously restless. The use of oxygen is often postponed, even by the doctor, as he himself is "anxious not to alarm the patient." The education of the public that oxygen inhalation is a therapeutic measure of great value and not a forlorn hope is, therefore, an urgent need.—We are, etc.,

SOL. M. COHEN.
WILLIAM W. MUSHIN.

Dartford, Jan. 10.

Adie's Syndrome

SIR,—In the annotation (January 11, p. 58) it is implied that the syndrome referred to under the above title was first identified by Adie. Sixteen years ago I published an account of the condition with illustrative cases at the congress of the Ophthalmological Society of the U.K. (*Trans. ophthal. Soc. U.K.*, 1924, **44**, 38). Adie's first communication was before the same society some six or seven years later: he extended the observations in several particulars, but added no essential point. He suggested the title "myotonic pupil," which has been accepted and is perhaps more appropriate than the more cumbrous one of "pseudo Argyll Robertson" which I had applied to it.

My own notes and books are no longer available, so that I cannot here give the exact references, but I believe I stated them accurately in a previous letter on the same matter published in the *Journal* about six years ago. I may perhaps quote the summary of my observations from the second edition of *Medical Ophthalmology*, which was published fifteen years ago (p. 136). (1) The contraction with convergence, and dilatation when convergence was relaxed, were characteristically slow. (2) None was associated with paralysis of accommodation. (3) All dilated freely with mydriatics. (4) In four out of seven cases they were uniocular. (5) None of the cases was associated with syphilis. (6) The knee-jerks were present in every case. (7) In no case was there evidence of parasyphilitic or any other general nervous disease, even after so long as thirteen, thirty-six, and forty years in three cases. I afterwards commented on its preponderance in the female sex.

It will be seen that the condition was recognized and described a number of years before Adie's report of it.—I am, etc.,

R. FOSTER MOORE.

Bemerton, Salisbury, Jan. 12.

Some Nutritional Problems of War and Peace

SIR,—In your report of my recent lecture to the Pharmaceutical Society (1940, **2**, 913) I am quoted as having said: "Calcium was known to be essential, but not its quantities. . . ." The report is at fault. Not only did I not make this remark, but I have, along with Prof. Drummond (*J. Soc. chem. Industr.*, 1940, **59**, 37), published our joint views as to marginal and optimal daily requirements for this element. We have there expressed the opinion that for the "average" man of about 10 stone weight the respective figures are 750 and 1,500 mg.—I am, etc.,

A. L. BACHARACH.

Greenford, Middlesex, Jan. 6.

The Mobile Unit in Action

SIR,—May we crave your indulgence in asking you to publish yet another letter regarding this important subject. The tendency of the majority of your recent correspondents has been to disparage the use of these units, but close scrutiny will reveal the facts that either your correspondents' experience has been extremely limited or else there has been some gross lack of co-ordination with Control or the other allied services.

We are in charge of the two mobile units attached to the metropolitan borough of Southwark. During the months of September and October last we attended a total of forty-four incidents, excluding the incidents attended only by doctor and nurse. Our average is, therefore, 22 as compared with the average for the country of 4.4. The total number of casualties dealt with was over 200, and in one major incident the two units working side by side dealt with forty casualties, apart from giving morphine to five trapped persons. You will therefore readily appreciate the fact that in this metropolitan (not rural or urban) district the mobile first-aid unit is held in high esteem.

May we also draw your correspondents' attention to another feature which they have apparently overlooked—namely, the "insurance" value of the unit. We are still in the early days of aerial warfare, and all too often one reads of hospitals, first-aid posts, and ambulance stations being destroyed. The mobile unit is invaluable inasmuch as it will in an emergency form the nucleus of an improvised hospital (in conjunction with the mobile surgical unit); it can replace a first-aid post at a moment's notice (we have already had personal experience of this); and, finally, in the event of ambulance transport being overworked or destroyed the unit will go to the casualties instead of their being sent to hospital or a first-aid post.

In view of our extensive experience we would respectfully suggest that the mobile first-aid units are invaluable in the A.R.P. scheme, not only because of what they can do when properly used, but also because of what they might do should the emergency arise—as possibly it might.—We are, etc.,

M. M. SCOTT.
H. C. DUNDON.

London, S.E.17, Jan. 6.

SIR,—I have been very interested in the letters which you have published recently giving your readers' views and experiences on mobile van duties during air raids. I thought you might be interested in our experiences in Sheffield during the recent raids here.

The van was staffed by nurses and two doctors. The idea of the van was to establish a first-aid post should the local one be destroyed, or to perform any urgent operation such as an amputation should this be necessary to free a person trapped by fallen debris, etc. Our first call was to a case of two casualties at a point distant about two miles from the hospital. We arrived to find that they had been sent to the F.A.P. At the post we were told that one case had been sent to hospital by ambulance and that the other was being given shelter following suture of a simple laceration. The next call was an urgent one to the centre of the city to deal with many casualties. After driving through water, broken tram-wires, and making detours to get past blocked roads we reached our destination to find a ring of blazing buildings and not a person in sight. Bombs were dropping all round, as the light from the fires was so good that one could have read a newspaper. We finally discovered a group of wardens vainly trying to rescue someone trapped under

about twenty tons of debris. We returned, narrowly missing driving into an unexploded bomb crater on our way back. Later we were again called out to a man trapped in a fallen building. This turned out to be genuine. The man was caught by the foot with fallen masonry. We were asked to wait for fifteen minutes while the rescue party attempted to free him. This they successfully accomplished, and the man was sent to hospital by ambulance. The "all clear" went in the middle of the last case.

It seems to me that as it is impossible to verify calls during a raid a mobile van is simply at the mercy of any nervous individual who cares to phone up the hospital direct or the police station. The only sensible solution would appear to be that no mobile unit should be sent out until after the raid is over, as the extremely slender chance of their being able to do any good is completely outweighed by the risks encountered. I may say that it is an experience never likely to be forgotten by any taking part in it.—I am, etc.,

Sheffield, Jan. 11. R. E. MCLACHLAN.

SIR,—Although a mobile first-aid unit under the present circumstances has limited uses if it is not superfluous, there are, I think, three occasions on which a well-equipped mobile resuscitation unit can be of great service. The first two have frequently been encountered round here in the last four months. (1) For casualties under buildings who have been reached by the rescue party but who are still pinned down by the wreckage, fallen beams, etc. (2) For those who have been under wreckage for a long time and come out in such a shocked condition that it is imperative for them to be treated before an ambulance journey can be undertaken. (3) For small towns which suffer a concentrated attack and whose hospital facilities are inadequate to deal with the volume of casualties.

An ambulance with the upper stretchers removed can quite easily be fitted out with the complete apparatus for treating shock. One patient at a time is normally treated in it, but if necessary two can be managed. In the ambulance here we carried eighteen bottles of plasma and a corresponding number of transfusion sets, with half a dozen blood bottles full of sterile citrate for washing out apparatus, and a cutting-down set and accessories. This apparatus could easily be used in the ambulance, and the simplicity of the E.M.S. transfusion set makes it ideal for taking into wrecked buildings and using under difficult circumstances. The morphine is carried in rubber-capped bottles for use with a syringe, and a supply of tubunics is also kept. A 100-cubic-foot cylinder of oxygen was kept under the stretcher for use in the ambulance, and in addition a small portable cylinder was taken for use outside. The interior of the ambulance was heated, and we carried hot tea, rugs, hot-water bottles, and blocks for raising the foot of the stretcher. In addition the usual first-aid surgical equipment was of course carried.

With this type of unit it is only necessary to be called out when conditions (1) and (2) are met with, and not for ordinary casualties, where the quicker they reach hospital the better. And, in addition, one often has several hours' notice as to when the trapped casualties are likely to be reached. Transfusions can be sometimes performed under the wreckage, and those suffering from prolonged exposure can be treated at the earliest possible moment in the ambulance (very often long after the raid is over).

In the case of emergency (3) a large number of bottles of plasma or blood, transfusion sets, blankets, hot-water bottles, and a personnel of half a dozen can be ready to start at an hour's notice to equip and manage a resuscitation ward, where needed, or to help in an overworked hospital.—I am, etc.,

Guy's Hospital, S.E.1, Jan. 9. PETER H. CARDEW.

Second Attack of Cerebrospinal Fever

SIR,—The following brief statement (and request for information) may be of interest to readers.

In February of last year a boy aged 16 was notified as a case of cerebrospinal fever. To-day a report has been received that he is again suffering from this disease. Dr. Edwards of the County Laboratory confirms that on both occasions meningococci in culture were obtained. Dr. Cowan last year kindly supplied me with notes as to the treatment. Serum was given in the early stages combined with sulphapyridine. (Clinical notes and full bacteriological reports have not been recorded in order to save space. They are available if required.)

May I ask: Are two attacks as unusual as my limited experience suggests, and does the prompt use of sulphapyridine prevent the development of immunity?—I am, etc.,

H. B. BINKS,
Stafford, Jan. 6. Medical Officer of Health.

Unification of Shelter Control

SIR,—Dr. Margaret Lowenfeld (January 4, p. 28) accuses me of quibbling about the word "dictator," but, unfortunately, it was used in an editorial heading. It is important that we do not use this sinister term when something else is intended. That the unification of the medical services of the metropolitan area is an urgent necessity no one would deny, and it is what we must press for. To believe that either the medical profession or any other body can solve their problems by appointing a "directing mind" or dictator with the same "full authority to act" as the Government already possesses through the Orders in Council is fallacious. Why are the practical and admirable suggestions concerning organization as outlined by Dr. Lowenfeld and other correspondents not immediately utilized?

As numerous solutions of this problem have been suggested by both medical and lay bodies and have hitherto not been put into practice, the medical profession is now confronted with the necessity of deciding where the responsibility lies.—I am, etc.,

Pontypool, Jan. 6. A. S. JARMAN.

Proprietary Names for Drugs

SIR,—In three consecutive issues of the *Journal* (December 21, p. 875, annotation on Rationalization of the British Drug Industry; *Supplement*, December 28, p. 59, Mr. E. Lewis Lilley's article on N.H.I. prescribing; and January 4, p. 33, Dr. R. Forgan's letter) reference has been made to the difficulties created for the medical man by the multiplicity of proprietary synonyms for medicinal substances. But no solution is anywhere suggested for what, after all, is becoming an intolerable state of affairs.

While it is true that many of the larger firms when marketing official substances under proprietary names usually indicate on their packings the English official name of their product, this practice is not sufficiently general to be helpful. But the whole situation could be greatly simplified if the provisions of the Therapeutic Substances Act and Regulations respecting the naming of the substances there dealt with were made generally obligatory—that is, that underneath the brand name on the label must appear the English official name of the substance in letters equally large. This could be extended to include all preparations where the chief active ingredient was an official substance.

A difficulty, of course, arises when it comes to dealing with important substances not yet official, and it is here too that more than simple questions of nomenclature would have to be considered. Is it not high time that in this country we had a body comparable in its aims and functions with the Council on Pharmacy and Chemistry of the American Medical Association and working in close collaboration with the parent body? A substance, whether protected by patents or not, accepted for inclusion in "New and Non-official Remedies" and/or the corresponding British publication could then have chosen for it, by the accepting body or bodies, a "standard" name, which, for the purposes of labels, circulars, and advertisements, would have the same status as an English official name.

The situation would then be such that similar provisions would apply to the use of proprietary names for both "official" and "accepted" substances. The obligatory use of the English official or standard name in all instances would have manifest advantages over an obligation to give only, in addition to the trade name, the chemical description of the product, for this, in many instances nowadays, is too complex to convey anything to the average practitioner, and, in any event, is capable

of such manipulation and variation in its expression as to give more than momentary difficulty even to a chemist.

The operation of such a scheme as suggested here would, while maintaining some at least of the supposed advantages of the trade name, remove nearly all its manifest disadvantages. Thus, in the case, say, of an important new chemotherapeutic substance discovered and marketed by a single firm under a trade name, the firm would have all the advantages accruing from both their monopoly and their use of this name, but the medical profession would presumably be so familiar with the standard name by the time the product became official that it would not be worth the while of any firm to devise a new one. The method would then perhaps be generally adopted that, while the firm which gave the world "M & B 693" would continue to give it, the firm of Blank would be content to offer sulphapyridine (Blank), and everyone, including the poor pharmacologist who has to teach about these things, would be satisfied.—I am, etc.,

Jan. 10.

W. A. BAIN,
Reader in Pharmacology, Leeds School of Medicine.

Robert Burns's Diet

SIR,—In praise of the Scottish ploughman's fare Dr. S. Watson Smith (January 11, p. 63) states that "on this diet Robert Burns, that prince among poets, was nurtured, and subsisted all his days." As Burns died at 37 Dr. Smith can hardly be accused of overstating his case.—I am, etc.,

Jan. 13

M. NEWFIELD.

Universities and Colleges

UNIVERSITY OF LONDON

Sir Ernest Graham-Little, M.P., has been unanimously re-elected chairman of the Council for External Students of the University of London for the year 1940–1.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

At a meeting of the Council of the Royal College of Surgeons of England, held on January 9, with the president, Mr. Hugh Lett, in the chair, Surgeon Rear-Admiral G. Gordon-Taylor was appointed Bradshaw Lecturer and Mr. L. R. Braithwaite Moynihan Lecturer for 1941

Mr. Lett was congratulated on having received the honour of a baronetcy.

Dr. Gilbert Orme was reappointed as representative of the College on the Council of the Queen's Institute of District Nursing.

The Hallett Prize adjudged on the result of the recent Primary Fellowship examination was awarded to Jenkin Dillwyn Thomas Jones of the University of Durham.

The posts of the three house-surgeons at the Palmerston North Hospital, New Zealand, were recognized for the six months' surgical practice required of candidates for the final examination for the Fellowship.

The date of Mr. R. E. Smith's Hunterian Lecture on the undescended testicle has been changed to January 23. The lecture will be delivered at the Royal Society of Medicine (1, Wimpole Street, W.), as will all the others announced in this column on January 11 (p. 67). This was omitted by an oversight from the original announcement.

Diplomas

Diplomas in Psychological Medicine were granted, jointly with the Royal College of Physicians of London, to the following candidates:

Margaret MacK. Methven, G. C. Rae, B. A. MacG. Williamson.

L. S. Powell and R. L. Dunlop (*J. Kansas med. Soc.*, 1940, **41**, 432) record two cases of visual disturbance complicating mumps. The first was in a boy aged 11 years who three weeks after the onset of mumps developed severe optic neuritis as well as labyrinthitis. Some improvement took place, but a veil about the vessels at the optic disk and slight pallor of the nerve head persisted. The second case also occurred in a boy aged 11 years, who in convalescence from mumps developed a mild papillitis with paralysis of accommodation. Complete recovery took place.

Obituary

HERBERT TILLEY, M.D., F.R.C.S.

Consulting Surgeon, Ear, Nose, and Throat Department, University College Hospital

As announced in our last issue, Mr. Herbert Tilley died on January 6, aged 74. He was born at Shepton Mallet, Somerset, and was educated at Queen's College, Taunton, and University College Hospital. He graduated M.B., B.S. of the University of London in 1890, took the M.D. in the following year, and was granted the diploma of F.R.C.S. in 1898. He was consulting surgeon to the ear, nose, and throat department (Royal Ear Hospital) of University College Hospital and laryngologist to the Radium Institute. In 1931–2 he was president of the Medical Society of London and in 1932 was elected a Fellow of University College. He joined the British Medical Association in 1895, was secretary of the Section of Laryngology and Otology when the Association met at Portsmouth in 1899, was vice-president of the same Section at Ipswich in 1900, and was president of the Section of Laryngology at the London Meeting in 1910.

The passing of Herbert Tilley will evoke profound regret among a large section of the profession, for he occupied during many years an outstanding position in British laryngology. He first practised in Hampstead, an experience which he always regarded as of great value, but soon became interested in laryngology, and was appointed to the staff of the Throat Hospital in Golden Square. When a department for diseases of the throat and ear was established at University College Hospital he was appointed to take charge of it, and it was to the welfare and development of that department that he thereafter devoted his time and energy unsparingly. The department, which eventually became amalgamated with the Royal Ear Hospital and, by the liberality of Geoffrey Duveen, is housed in a carefully designed building adjacent to University College Hospital, was his special pride. He took up the study of laryngology at a period of very active progress, when development was proceeding in almost every direction, and his own contributions were mostly in connexion with the pathology and surgery of the accessory sinuses of the nose. He wrote much about this, especially in the later editions of a book of which the first had come from Dr. de Havilland Hall, whilst the fourth and last edition, so much revised and expanded as to be almost a new book, came from himself alone. Finally, in 1934, he gave a final exposition of his views on the pathology of sinusitis in a Semon Lecture, which was filled with original clinical observation and wisdom. This work established his reputation both on the Continent and in the United States, so that besides having the unusual distinction of being president of both the Section of Laryngology and the Section of Otology at the Royal Society of Medicine, he received the rare honour of admission to that exclusive body the American Laryngological Society. To travel with him was a delightful

experience, for he counted all the leading Continental laryngologists among his friends and his friendly generous character attracted everyone.

There is one activity by which probably he would particularly wish to be remembered, and that is his long connexion with the Semon Lecture Board. When the lectureship was founded by Sir Felix Semon with the fund subscribed for him by his friends and colleagues, it was placed in the care of the University of London, and the university wisely—sometimes officially and sometimes unofficially—committed it to the charge of Tilley. With such discretion did he discharge this trust that the reputation of this lectureship stands very high. He himself spoke of it once as the blue riband of laryngology, and it was due to him that it could be so described. It was characteristic of him that for many years he persistently refused to deliver the lecture himself on account of his connexion with the management, and it was not until 1934 that his scruples were finally overborne by the vehemence of some younger colleagues.

Tilley easily attracted round him in his clinic keen workers, to whom he was kind and generous, and many of these hold important positions elsewhere. Much of his work is of permanent importance, especially that on the accessory sinuses and on the prognostic significance of a fixed vocal cord, but, above all, he will always be remembered as the perfect colleague.

Sir STCLAIR THOMSON writes:

Herbert Tilley, although not one of the founders, was certainly one of the early builders of British laryngology. He was also one of the very few survivors of the period, at the end of last century, when those who devoted themselves to a special subject had first been trained in the hard apprenticeship of general practice. This was all to their own and their patients' benefit, particularly in the art and humanity of clinical medicine. It is no longer possible owing to the length of years now required for becoming acquainted with technical details of the many methods of scientific investigation. Tilley was in general practice in the neighbourhood of Swiss Cottage when he joined the staff of the small Throat and Ear Hospital in Great Portland Street, now extinct. Fortunately he already possessed the diplomas of M.B. and B.S.Lond., as well as the F.R.C.S., which qualified him not only for aspiring to the staff of larger hospitals, but fitted him for the work he was to do in the surgical field of laryngology, which was only then beginning. Before his day the pioneers of laryngology were generally, like Sir Morell Mackenzie, Semon, and de Havilland Hall, physicians. His next step was to the Throat Hospital in Golden Square, to which I had the good fortune of being elected his colleague at the same time. He resigned this appointment when chosen as the first specialist of otolaryngology in his old school, University College Hospital, a department of which he may be regarded as the founder, where he had a long and distinguished career in a school he served loyally.

His contributions to investigations and literature extended over the whole field of his special subject, and, particularly in the clinical field, were all trustworthy and bore evidence of his extensive experience. Perhaps his best work was that on paranasal sinuses, in which he was a leading pioneer at a time when that area was still a *terra incognita*. He laid the foundation of it by his investigations into their anatomy, and the value of his clinical work was much increased by his honesty in publishing the disasters which were known to occur in the hands of many of us forty years ago. The value of his careful note-taking was apparent in his records of the occasional spontaneous disappearance in some cases of what appeared to be established sinus suppuration, and also in his reports of the changes sometimes seen in the after-histories of certain cases of paralysis of the recurrent laryngeal nerve. His intimate knowledge of laryngeal cancer, dating from the early days of laryngofissure, led him to favour the idea that there might be a constitutional tendency to cancer. The occasional reappearance of this disease, not in exactly the same area, and sometimes after a free interval of five or even ten years, was more certainly regarded by him as suggesting evidence of a local predisposition to recrudescence (as apart from recurrence) in the larynx and pharynx. Tilley's writings were clear and readable, and his contributions in debate showed clear thinking and lucid explanation, and were made more welcome by his distinct articulation and diction.

This wide and thorough knowledge of his work, with an attractive personality and a sympathetic nature, secured for him a large and enduring practice. The trust he inspired was also shown by the frequency with which colleagues consulted him when they themselves required advice in his department of practice. I have myself grateful recollection of his sympathy when seriously ill nearly forty years ago. Tilley was blessed with a devoted wife, who shared in his tastes and his sports. To both of them it was a regret that they had no children to join in their happy companionship. For both of them age, as too often happens, brought its clouds. The chronic illness of his wife was a grief to him. His own health had been threatened for some years, and the difficulties of wartime and the devotion and care for his beloved companion made the strain too great for his diminished resistance. Tilley will be sadly missed by his fellow workers: he was a friend to all of them.

[The photograph reproduced is by Elliott and Fry, Ltd.]

E. D'ARCY McCREA, F.R.C.S., and EDITH F. W. McCREA, F.R.C.S.I.

We deeply regret to record the tragic deaths through enemy action of Mr. E. D'Arcy McCrea and of his wife, Dr. Edith F. W. McCrea. They were killed and their two children with them during an air attack on Manchester.

Mr. D'Arcy McCrea qualified M.B., B.Ch., B.A.O., Dublin, in 1917; three years later he took his M.D., and in 1922 the M.Ch. and the F.R.C.S.I. In 1926 he took the F.R.C.S.Eng. While still in Dublin he was assistant surgeon to Sir Patrick Dun's Hospital. At the time of his death he was honorary consulting surgeon, Eccles and Patricroft Hospital, Manchester, and honorary surgeon to Salford Royal Hospital.

We are indebted to Mr. J. B. Macalpine for the following account of his life and work.

D'Arcy McCrea qualified in Dublin in 1917 after a brilliant student career in which his name appeared many times in the prize lists. In due course he was appointed to the staff of Sir Patrick Dun's Hospital as an assistant surgeon. Almost immediately, however, the political atmosphere of South Ireland became unfavourable to one who was not of the Roman Catholic faith, and McCrea determined to seek his fortunes elsewhere. It was then that he joined me as registrar in the urological department of the Salford Royal Hospital. From about 1922 to the present time I have enjoyed an association and collaboration which continued quite unclouded by any misunderstanding until rudely broken by this tragedy. In due course McCrea gained a place on the assistant surgical staff of the Salford Royal Hospital, and for the last few years had been on the full staff. As a lieutenant he was a most loyal and willing helpmeet, careful, painstaking, and reliable in his routine work, and always willing and anxious to take up a new problem and capable of following it intelligently and studiously. In his earlier days he did much admirable work on the musculature of the bladder, especially of the bladder neck, subjects of which the difficulties are well known. He applied himself also to many questions concerned with the physiology of that organ, working out some of them in the physiological department of the Manchester Medical School, and also making contributions to the literature on the indications for presacral neurectomy in disturbances of bladder function. For the last ten years McCrea's principal interests

were in diseases of the male genital tract, a subject on which he had accumulated a big fund of knowledge and an exceptionally large clinical experience. It was his intention to produce a series of monographs on this branch of surgery, and the book on diseases of the urethra and penis published so recently as May, 1940, was but the first of these. The work on other sections was well advanced, and I know that a great amount of unusually rich material, particularly that referring to disease of the testicle, has most unfortunately been lost, together with pathological specimens collected over many years and numerous drawings of their macroscopical and microscopical features. The book mentioned has been more than well received, but I know that subsequent sections would not have fallen behind the standard already set. So much valuable material lost is lamentable, but its loss pales beside that of the life thus wantonly and cruelly destroyed—a life which showed much accomplished, yet more waiting to be garnered.

McCrea was not a club man nor one who went out much in society. Few knew him intimately. Rather reserved and possibly shy, his interests were in his home and his family, and he was a voracious reader. Yet he enjoyed good conversation and meeting men of similar interests, as, for instance, at the dinner of a scientific society. Twenty years ago he became the first string in the Irish lawn tennis team, and on coming to Manchester was a regular member of the Lancashire team. He was a formidable singles player, and when representing Ireland in the Davis Cup it was his lot to face the redoubtable Tilden. However, he took a handful of games from his opponent, and the latter is credited with the remark that "had McCrea not been so keen on surgery he might have become a world beater."

Dr. Edith F. W. McCrea qualified B.A., M.B., B.Ch., B.A.O., Dublin, in 1921. She took her D.P.H. in 1922 and in 1925 the F.R.C.S.I. She was honorary surgeon to the Manchester Babies' Hospital, surgical registrar and surgical assistant, Ancoats Hospital, and surgical assistant, Stretford Hospital, Manchester. A colleague writes:

Edith McCrea was clear-cut, physically and mentally, and her heredity, training, and environment were sharply etched in her personality. The daughter of an able Anglo-Irish family, her father an Indian Civil Servant and her aunt, Miss Sophie Bryant, one of England's best-known educationists, she was trained at Cheltenham College and Trinity College, Dublin. Coming to Manchester after a career distinguished both academically and in the field of sport, she became resident medical officer at the Manchester Babies' Hospital. Intent on surgery, she took the F.R.C.S. Ireland, and later was appointed honorary surgeon at the same hospital. She also worked at Ancoats Hospital and the Stretford Memorial Hospital. She was a quick and accurate worker and a precise writer. We know that she was about to publish a paper on pyloric stenosis, the outcome of many years of careful preparation, but we fear this may have been lost in the raid. Intolerant of those she considered fools, she had a smile and charm that won her way, and with children she was delightful. She was the devoted mother of two children, who were already showing that they had inherited their parents' ability.

ANDREW TRIMBLE, M.B., B.CH.

The death of Dr. Andrew Trimble, former Chief Tuberculosis Officer for Belfast, removes a prominent and popular member of the medical profession in Ireland.

Andrew Trimble, who was born at Dungannon in 1867, graduated M.B., B.Ch., B.A.O. at the old Queen's College, Royal University of Ireland, in 1895, and was in general practice for several years. He took his D.P.H.Belf. in 1910. He had the distinction of being the first Chief Tuberculosis Officer for the city of Belfast, a position which he filled with ability for upwards of a quarter of a century. During this time he saw the death rate from consumption fall from 209 to 78 per 100,000. While still a young man he was elected to the council of the county borough of Belfast, and in this capacity took a keen interest in the activities of the public health department and in the local administration of the Children's Act. His main interests in life were the education of the public in health matters and the welfare and health of children, for whose benefit he established in Belfast an open-air day school, the first of its kind in Ireland. In 1925 Dr. Trimble made a special journey to Switzerland to investigate Spahlinger's work. He also visited Prof. Moelgaard at his laboratory in Copenhagen, and there obtained the first supplies of sanocrysin for experimental use in Belfast. In 1928 he was one of those chosen by the Joint Tuberculosis Council to visit Canada to report upon the progress of the research work there. He also went to the United States on two occasions to learn the latest developments in the diagnosis and treatment of this disease.

Dr. Trimble was a man of diverse interests and catholic tastes. It would be difficult to find a medical man who got through more intensive medical reading, yet he took a keen delight in the literature of history, biography, and archaeology. He toured Europe, and visited the ruins of Troy, ancient Babylon, the Pyramids, and Palestine. He was associated with a large number of social and philanthropic bodies, and was noted for his generosity and charity to the many services and works in which he was interested. He was a member of a number of medical societies, and had held high office in some of them. When the British Medical Association met at Belfast in 1937 he was vice-president of the Section of Tuberculosis. He was well known at tuberculosis conferences, where his views were always heard with interest and respect. A prominent medical officer of health said of him: "I have known him for almost thirty years, and from the first time I met him I regarded him as a man of unparalleled gifts: I have never changed that opinion." He was much loved, and will be greatly missed by his former colleagues and staff at the tuberculosis institutes.

EDGAR OLIVE TURNER, M.B.

We regret to record the death of Dr. Edgar O. Turner of Great Missenden at the age of 74. Dr. Turner was educated at University College in the old Gower Street days, and from there he went to University College Hospital for his medical training, working under Sir Thomas Barlow. He qualified M.R.C.S., L.R.C.P. in 1888, and in the following year M.B. with honours. In 1894 he started practice in Great Missenden and soon became a great favourite in the district, remaining in actual practice there for nearly fifty years. His chief endeavour seemed to be to lighten the burden of those with whom he came into contact; he was regarded by his patients as their friend and confidant as well as their doctor. Turner was deeply inspired by the Christian faith and was a churchwarden for many years. His local activities included that of Justice of the Peace for Bucks and chairman of the Parish Council for over forty years. There was no more loyal member of the B.M.A., to which he had belonged for forty years; he was president of the South Midland Branch in 1922–3, a representative in the Representative Body from 1926 to 1932, a member of the Central Ethical Committee and its Standing Subcommittee from 1919 to 1921, and a member of the Central Council from 1918 to 1924. He was also a representative on the Bucks Insurance Committee. By nature kind and sympathetic, he will be sadly missed by all who knew him.

We regret to record the death on November 18, 1940, of Dr. HENRY LATHAM of Worthing at the age of 70. Dr. Latham was educated at the University of Edinburgh, where he graduated M.B., C.M. in 1892. After short periods at Malvern, Stockport (where he was visiting surgeon to the local infirmary), Hassocks, and Fleetwood he settled in practice at Peterborough in 1899 and remained there until 1924, during which time he was honorary physician and senior anaesthetist to Peterborough Infirmary, and medical officer and public vaccinator for the Peterborough district of the Peterborough Union. In 1935 he moved to Worthing. He had been a member of the British Medical Association for thirty years.

We regret to record the death at Devonport on December 4, 1940, of Dr. GEORGE FREDERIC GLINN at the age of 75. Dr. Glinn received his medical education at St. Mary's Hospital, and qualified M.R.C.S., L.R.C.P. in 1889. After a short period at Devonport he went to live at Bicester, where he practised for some seven years. In 1900 he settled in practice at Camden Square, London, where he remained until last year. He had been a member of the British Medical Association for thirty-nine years, and was chairman of the old St. Pancras and Islington Division in 1910.

We regret to announce the death on December 12, 1940, at the age of 67, of Dr. EDWIN GARRETT BUNBURY. Educated at Wellington College, Bunbury then went to Cambridge University, completing his medical education at Bristol; he qualified M.R.C.S., L.R.C.P. in 1898. After holding the appointment of resident medical officer at Clifton Dispensary he was in practice for some years at the Lizard and Mullion, Cornwall. He saw service in the last war for two years in France as a captain in a field ambulance, at No. 30 General Hospital, Calais, and at another base hospital at Etaples. He then practised for four years at Colsterworth, Lincolnshire, before going to Thorverton, Devon, where he was in practice for fourteen years until he retired to Ottery St. Mary in 1939. A wide circle of Dr. Bunbury's former patients in the rural district of Thorverton will mourn the death of one who had long been a welcome visitor as general adviser and friend as well as doctor, for though of a modest and retiring disposition he obviously loved the country folk, and was for many years chairman of the British Legion at Thorverton. He was a member of the British Medical Association for thirty-five years, and was a most regular attender at all its local meetings and those of the Devon and Exeter Medico-Chirurgical Society. He leaves a widow, a daughter, and a son now in the R.A.F.

Dr. WILLIAM SAVILE HENDERSON, who died at Parkstone on December 17, 1940, was the son of the late Mr. Gavin Henderson of Liverpool. He qualified M.B., Ch.B. of the Victoria University of Manchester in 1899, and in the same year took his M.R.C.S., L.R.C.P. In 1906 he obtained the M.D. of the University of Liverpool. His resident posts included those of house-surgeon and house-physician at Liverpool Royal Infirmary; he was also assistant demonstrator of physiology and anatomy at the Liverpool School of Medicine, and a Gee Fellow in anatomy at the school in 1900–1. He was in practice in Liverpool until 1919. In the following year he became medical officer of health to the Helston Rural District and medical officer and public vaccinator for the fourth Helston district. In 1923 he moved to Taunton and in 1926 was appointed medical officer to Sedbergh School, a post he held until 1928, when he moved to Paddock Wood, Kent. He went to Manchester in 1935. He had been a member of the British Medical Association for thirty-six years.

Dr. ROBERT GEE STERLING, who died suddenly after a long illness on January 3 at his home at Ash Vale, near Aldershot, was the son of the late Canon Robert Sterling, M.B., B.S.Durh., founder of the Church Missionary Society's Hospital in Gaza, Palestine. Dr. Sterling qualified M.R.C.S., L.R.C.P. from the London Hospital in 1915, and served as a captain in the R.A.M.C. from 1916 until the end of the war, principally in Palestine. At the close of hostilities he, with his young wife and family, returned to Gaza and rebuilt the mission hospital, which had been bombed by the British during the occupation of the town by the Turks, who were using the premises as an ammunition store. The hospital was renamed the Sterling Memorial Hospital in memory of Dr. Sterling's father. Dr. Sterling remained as medical superintendent of the hospital in charge of the 150 beds until a serious illness overtook his wife and he was obliged to return to England. For the past ten years he has been in practice at Ash Vale, where his straightforwardness, devotion to his work, and untiring efforts endeared him to a wide circle of friends, colleagues, and patients. He was a staunch supporter of the British Medical Association, which he joined in 1929, and was a member of the executive committee of the Guildford Division from 1935 to 1938, and vice-chairman of the Division 1938–9. Dr. Sterling is survived by his wife, the daughter of the late Rev. Greenway of Eldon, Co. Durham; they had three sons and three daughters.

Dr. JOHN STRATFORD HALL, who died recently at Sheffield at the age of 70, was the son of Anthony Hall of Binchester Hall, Bishop Auckland, and came of an old seafaring family. He qualified M.B., B.S.Durh. in 1892, subsequently taking the B.Hy. in 1897. He began practice in the Manchester area, but in 1907 he went to the Hillsborough district of Sheffield. In 1914 he joined up, and the following year went to France, where he was rather badly gassed. He then became sanitary officer of camps at Belton Park and Harrowby. After the war he returned to general practice. His patients were to be found in both town and country, but his heart was obviously in the country part of his practice. As might be guessed from his heredity he possessed individuality and personality; his kindly, cheery manner was a great help to his patients, in whose service he never spared himself. To the last he was keenly interested in the progress of medicine and surgery. He was a great reader and always carried some books about with him in his car, so that he could, if he had half an hour to spare, draw the car up in some corner of the moors or valleys which he loved and sit down and read. He was one of the best-read medical men in the district. During the last few months, in spite of ill-health due to a failing heart, he not only carried on his practice but was able to attend medical boards; he enjoyed the opportunity which this work gave him of meeting his colleagues. He was also in charge of a first-aid post. For many years he was doctor to the Cripples' Home at Loxley. He had been a member of the British Medical Association since 1908. His loss will be regretted by many patients and colleagues.

Dr. PATRICK JOHN CARROLL, who died on January 4, was educated at Queen's College, Cork, where he was a senior scholar, and graduated M.B., B.Ch., B.A.O. of the Royal University of Ireland in 1902. During the war of 1914–18 he served in the R.A.M.C. as a lieutenant. He had been in practice in Manchester since 1909, where he was a well-known and popular member of the profession. He joined the British Medical Association in 1926.

A neurophysiological section has recently been added to the Carolinian Medical Institute in Stockholm, Sweden's principal medical school. It is under the direction of the Finnish-Swedish scientist Prof. Ragnar Granit, a pioneer in and an international authority on electrophysiology. Prof. Granit has taken with him from Helsingfors electrical and optical precision instruments, partly acquired or designed with means contributed by the Rockefeller Foundation. The rooms in which the new section is housed have been specially prepared so that when weak "action currents" in the cells investigated have to be amplified there shall be no interference from outside. Included in the equipment of the new section are two spectrophotometers and their amplifiers and several cathode-ray oscillographs.

EPIDEMIOLOGICAL NOTES

Infectious Diseases for the Week

The incidence of measles and whooping-cough increased during the week, the present levels being the highest so far recorded in 1940. Although the incidence of diphtheria has fallen slightly, as in the previous week, the severity of the disease is causing anxiety. A high incidence of non-fatal cases of diphtheria might prove an advantage in the long run, as the mass immunity would thereby rise rapidly. A safer, cheaper, and less unpleasant way to achieve immunity, whether in the individual or in the herd, is to inoculate non-immunes with one or other of the antigens now available. The possible effect of evacuation on the incidence of diphtheria may be considered from notifications for the corresponding weeks of 1940, 1939, and 1938 for the largest towns: Birmingham 32, 11, 20; Liverpool 73, 32, 57; London 46, 25, 173; Manchester 18, 10, 29; Edinburgh 34, 9, 13; Glasgow 146, 45, 81; Belfast 29, 16, 11. Although the incidence in London and Manchester is higher at present than in the previous year it is much lower than in the last "normal" year, 1938. On the other hand, in the other large towns the incidence at present is much higher, in some instances approximately three times higher, than in 1938, while the percentage of cases proving fatal is even greater. The figures for the various administrative districts suggest that the high incidence in the country as a whole is due to spread in the densely populated areas (from which an appreciable proportion of the presumed non-immunes have been evacuated), and not, as might have been expected, to the appearance of diphtheria in epidemic form in the reception areas, despite reports of such outbreaks in some quarters. During the week under review the counties more heavily infected were: Lancaster 235 (Liverpool 73, Manchester 18, Bootle 14, Fleetwood M.B. 10, Huyton with Roby U.D. 10); Glamorgan 125 (Swansea 39, Merthyr Tydfil 15, Cardiff 11); Devon 92 (Plymouth 58, Brixham U.D. 6, Newton Abbot R.D. 4, Exeter 4); Yorks, North Riding, 79 (Middlesbrough 68); Durham 78 (Jarrow M.B. 15, Sunderland 13, Gateshead 10, Stockton-on-Tees M.B. 9); Gloucester 54 (Bristol and Gloucester 23 each); London 46; Chester 44 (Birkenhead 12, Stockport 9); Leicester 44, of which 29 were in the city.

Quarterly Returns Ended September 30, 1940

Eire.—During the quarter 14,358 births were registered, of which 7,318 were males and 7,040 females, corresponding to a rate of 19.4 per 1,000 of the estimated population. Illegitimate births represented 3.1% of the total births. Deaths numbered 8,530 (4,400 males, 4,130 females), equivalent to an annual rate of 11.5 per 1,000 and 0.2 below the third quarter of the previous year. The infant mortality rate was 50 per 1,000 births registered, compared with 52 in the previous year. The principal infectious diseases accounted for an annual death rate of 0.4 per 1,000; the mortality from typhoid fever, measles, scarlet fever, and diphtheria fell, but rose for whooping-cough and diarrhoeal diseases in children under 2 years. Deaths from puerperal causes were represented by a rate of 2.9 per 1,000 births registered (0.4 for puerperal infection and 2.5 for other puerperal causes), being 0.2 lower than in the third quarter of the previous year.

Northern Ireland.—There were 6,334 births (3,254 males, 3,080 females) during the quarter, equivalent to an annual rate of 19.5 per 1,000 estimated population, and 0.1 below that for the third quarter of 1939, and 0.6 below the average for the third quarters of the five years 1935–9. Illegitimate births formed 4.5% of the total births registered. Deaths numbered 3,759 (1,921 males and 1,838 females), corresponding to an annual rate of 11.6, and 0.2 above the rate for the corresponding quarter of 1939. Infant mortality for the quarter was 76 per 1,000 births, compared with 55 for 1939 and an average of 61 for the preceding five years. The principal infectious diseases accounted for 0.76 of the total death rate recorded, compared with 0.51 in the corresponding quarter of 1939. Increases in deaths were recorded from diphtheria, scarlet fever, whooping-cough, measles, enteric fever, and diarrhoeal diseases in children under 2 years of age, but deaths from influenza were nearly halved.

No. 50 for 1940

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended December 14, 1940.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1940					1939 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	169	15	45	—	6	25	1	5	2	—
Deaths		3	3				1	—		
Diphtheria	1,392	46	455	40*	48	863	25	198	58	25
Deaths	53	2	12	1	2	14	—	7	2	4
Dysentery	78	2	35	—	—	33	1	33	—	—
Deaths			—	—	—			1	—	—
Encephalitis lethargica, acute	1	—	1		—	3	—	—		—
Deaths		—	2				—	—		
Enteric (typhoid and paratyphoid) fever	19	—	3	8	2	16	2	6	3	1
Deaths	—	—	—	—	—	—	—	—	—	—
Erysipelas		36	52	5	4			57	9	6
Deaths		—	—				—	1		
Infective enteritis or diarrhoea under 2 years										
Deaths	40	—	10	9	4	29	4	12	6	2
Measles	15,278	299	367†		8	2,248	8	23		66
Deaths	12	—	1	1	—	—	—	—	—	2
Ophthalmia neonatorum	76	4	17		—	78	3	24		—
Deaths										
Pneumonia, influenzal‡	866	66	15	3	9	450	18	5	—	21
Deaths (from influenza)	33	8	3	—	1	25	4	4	1	1
Pneumonia, primary			196	20				162	6	
Deaths§		37		16	10		—		13	8
Polio-encephalitis, acute	1	—				1	—			
Deaths		—					—			
Poliomyelitis, acute	10	—	5		—	4	—	1		1
Deaths		—	—				—	—		
Puerperal fever	2	2	12	1	1	—	—	12	—	1
Deaths		—					—			
Puerperal pyrexia	110	5	17		1	152	10	20		4
Deaths										
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,546	69	242	77	42	1,183	36	177	69	93
Deaths	—	—	1	—	—	1	1	1	—	—
Small-pox	—	—	—	—	—	—	—	—	—	—
Deaths		—	—	—	—		—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths			—	—	—			—	—	—
Whooping-cough	2,505	30	209		21	1,072	7	23		11
Deaths	10	—	3	4	—	—	—	—	—	—
Deaths (0-1 year)	311	18	68	45	17	316	34	55	32	22
Infant mortality rate (per 1,000 live births)										
Deaths (excluding stillbirths)	5,682	957	724	217	156	4,754	731	676	207	147
Annual death rate per 1,000 persons living			14.6	14.5	13.7			13.7	13.9	12.9
Live births	4,558	293	801	295	199	5,360	697	784	342	179
Annual rate per 1,000 persons living			16.2	19.7	17.4			15.9	23.0	15.9
Stillbirths	187	12	40			224	21	30		
Rate per 1,000 total births (including stillborn)			48					37		

* 1 case mixed infection diphtheria and scarlet fever.
† Notification in certain administrative areas only.
‡ Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland.
§ Since January 1, 1940, figures for London (b) have been for deaths from all forms of pneumonia; the corresponding figures for 1939 relate to deaths from lobar pneumonia only.

Medical News

A meeting of the Shaftesbury Military Hospital Medical Society will be held at the hospital on Tuesday, January 21, at 3 p.m., when Major-General Priest will give an address on "Cerebrospinal Meningitis."

Mrs. Neville-Rolfe, Secretary-General of the British Social Hygiene Council, has been awarded the Snow Medal for 1941 by the American Social Hygiene Association. This medal is given for "distinguished service to humanity," and is named after Dr. Snow, the first Director of the American Association, which was formed in 1913. Mrs. Neville-Rolfe is the fourth recipient of the medal and the first woman to be so honoured.

There are shortly to be shipped to this country the entire equipment of the hospital and laboratories and the complete medical and nursing staffs of the American Red Cross Harvard Hospital for Infectious Diseases. Harvard is providing the medical staff, the laboratory equipment, and $100,000 a year towards the financing of the venture, while the American Red Cross is giving a sum of $300,000, as well as the hospital itself, its equipment, and the nursing staff. Dr. John E. Gordon, Professor of Preventive Medicine and Epidemiology at Harvard University and Director of the Hospital, has already arrived in this country from Lisbon.

Two further instances of American generosity have come to our notice this week. The American Red Cross have bought for this country sufficient material for the preventive inoculation of 1,000,000 children against diphtheria. This was done in response to an appeal from the Ministry of Health through the British Red Cross, and part of the consignment is being hurried here by Clipper. The remainder is to follow by sea. The third instance concerns a tablet containing vitamins A, B, C, and D, flavoured with sugar and cinnamon, which is being manufactured under the direction of six New York physicians. The British-American Ambulance Corps is raising funds to send to England 9,000,000 of these tablets this year, sufficient for 4,000 children to take six tablets each daily. The first consignment has already left New York.

To avoid overlapping, states the *Times*, and to ensure that the sending of medical and surgical supplies, doctors, and nurses from the United States to this country will be regulated according to need, the British Government has decided that all requests made on its behalf shall be directed through the British Red Cross Society solely to the American Red Cross. Any offers of assistance of this kind received by the Government from American organizations will be referred in the same way.

The Royal Society of Medicine (1, Wimpole Street, W.1) intends to publish in the December number of the *Proceedings* the two discussions which were held recently at the Society's house, one by the Section of Medicine on "Traumatic Haemothorax" and one by the Section of Surgery on "Chest Injuries." The two discussions will be issued as a combined reprint at 2s. per copy. As the number is limited early application is advisable.

The exemption from key industry duty of all articles at present exempt, except dial, chinoline, dinitro-orthocresol, ethyl orthoformate, and metaldehyde, has been renewed until June 30, 1941.

At the suggestion of the Minister of Health, Lord Horder, accompanied by one of the Ministry officials, has visited a number of provincial centres at Bristol, Manchester, and Liverpool in order to assist the regional and local authorities on shelter matters.

Prof. A. Einstein, who has been professor of theoretical physics in the Institute for Advanced Studies at Princeton since 1933, has been admitted to American citizenship.

Prof. Angel H. Roffo has been appointed incumbent of the new chair of "cancerology" established at the faculty of medicine of the University of Buenos Aires.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

Authors desiring REPRINTS of their articles must communicate with the Secretary, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors over-seas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

ADVERTISEMENTS should be addressed to the Advertisement Manager (hours 9 a.m. to 5 p.m.). Orders for copies of the *Journal* and subscriptions should be addressed to the Secretary.

TELEPHONE NO.—B.M.A. and *B.M.J.*: EUSTON 2111.

TELEGRAPHIC ADDRESSES.—EDITOR, *Aitiology Westcent, London*; SECRETARY, *Medisecra Westcent, London*.

B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

QUERIES AND ANSWERS

Income Tax

Allowance of Subscriptions

"G. L. H." inquires if the refusal to admit a claim for deduction of B.M.A. subscriptions is correct.

*** Such subscriptions are allowable if the earnings are assessable under Schedule D—i.e., as the profits of independent professional work—but if they are assessable under Schedule E, as the profits of "employment," they are allowable only if membership of the Association is a condition of the employment. As a result of this rule they would apparently be inadmissible in the case of employment under the Crown.

House in Hands of Caretaker

"B. J." maintained a house which was in charge of a non-resident caretaker. He placed a board in the garden stating that he was away doing special work but that messages put through the letter-box would be forwarded. Can he claim a deduction for the rent, telephone, etc., of that house?

*** We fear not. The amount of professional use to which the premises were put in such circumstances hardly justifies the claim that they were occupied professionally.

Assessment of Partnership

"A" and "B" have been in partnership for many years, and have been assessed separately for their net shares of the profits. This year a single assessment has been made on the firm, and when one partner sent a cheque for his share of the tax the collector returned it saying it could be accepted only on the understanding that if the other partner defaulted he would be responsible for the whole amount.

*** The profits of a partnership are assessed by law in one sum on the firm, and the old practice of assessing the partners separately was legally incorrect. The collector's action, however, seems unnecessarily irritating in the circumstances. In theory the junior partner should pay his cheque into the firm's account or to the senior partner, and the latter should discharge the firm's liability.

Treatment of Gastric Flatulence

"B. A. J." writes: I should be grateful for any suggestions as to treatment or diet in the case of a woman aged 47 who suffers from gastric borborygmi. These "rumblings" occur at all times of the day, both before and after meals, and cause her some embarrassment and mental distress. Otherwise she is quite a normal healthy woman and has no other gastric symptoms. Ordinary routine treatment for flatulence by alkaline powders, charcoal, etc., has so far made no difference to the condition.

Dysmenorrhoea

Dr. A. A. LOESER (London, W.1) writes: In reply to "Country Practitioner" (December 28, p. 924), as the patient has to work I would recommend very strongly a subcutaneous implantation of 25 mg. of oestrone or oestradiol. This implantation takes only a minute to perform, and can be done in the doctor's own surgery.

LETTERS, NOTES, ETC.

Diphtheria Incidence

Dr. R. M. COURTAULD (Earls Colne, Essex) writes: Will an immunologist or a statistician kindly explain how it comes about that, in spite of all the Schick-testing and immunizing that have been done, the diphtheria incidence, as shown by the figures given week by week under "Infectious Diseases and Vital Statistics," is considerably higher than it was at the corresponding time last year?